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NOTES ON ANTISEPSIS.*

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The use of the word antisepsis in these notes is intended to embrace all devices that can be brought to bear in combating sepsis, either by prevention of its inception or antagonism when it is established.

The best index of value of medicine and surgery as a healing art has ever been in proportion to its power to combat sepsis, although perhaps not until modern times has this index of potency been appreciated. Hippocrates was alive to the phenomenon of contagion. Celsus, probably echoing the views of his predecessors, hints that disease may be caused by "corpusculae" entering the body; but as his conception of the definition of "corpusculae" is a matter of speculation, we are unable to gauge to what extent the ancients appreciated infection as we view it now.

With the first use of expectorants, purgatives, blood-letting, sea-water clysters, etc., medicinal antisepsis had its birth. Surgical draining of an abscess, the local depletion of an inflamed area, the use of salt or sea water, of spiced wine or pitch in the dressing of wounds, and the use of red hot knives for amputations were all seeds sown to spring up into the growth, antisepsis. Blood-letting and observing the "buffy coat" was the silhouette of our modern blood picture, in recognition and prognosis of the inflammatory process.

The immortal contributions of Jenner, Lister, Pasteur, Metchinkoff, Wright, and the vast army of modern investigators have pictured the ever-raging battle of tissue-cells and their invaders so clearly that it may appear to some that there is nothing further to add. Yet in following the application of recently established principals in guarding against or combating sepsis, as seen in the operating theater, or in the wards of our hospitals, are the various components of our armamentarium appreciated in their just proportions? Or is there a tendency, as the pendelum of fashion swings, to unduly overrate one method, and underrate another, when both may be entitled to equal consideration?

It is difficult logically to establish a rationale, explaining why any difference of procedure should exist, in the application of antiseptics for the prevention or anticipation of sepsis, and for the acting combating of established sepsis. Yet such a difference is commonly met in practice. As an illustration of this, the technic usually employed in the conduct of a "clean" case for operation, may be compared with the technic usually employed in the conduct of a septic case.

In the former circumstance there is used every artifice of sterilization that can be brought to bear to exclude contamination by bacteria, and beyond the employment of an antiseptic for the destruction or incarceration of bacteria in the skin area, no antiseptic comes in contact with the tissue-cells, which are usually in a condition of health and vigor.

In the latter contingency, the same elaboration of sterilization and purification is employed, but commonly an antiseptic is further used to come in contact with the infected area and with the devitalized and dying tissue-cells. If to be avoided in the first example, why not in both?

In routine hospital practice, assuming that it has been possible to secure an effective drainage, it is my strong impression that fewer septic cases that one might reasonably expect to make an uninterrupted recovery, fail to do so, than is the experience with "clean" cases, where uninterrupted recovery should be always confidently expected. The personal gauge of in what cases one may reasonably expect uninterrupted recovery obviously makes statistics of relative value only. We have all experienced the vexation of some breakdown of aseptic technic, until at times we may doubt the wisdom of undertaking an operation of magnitude, where the life of the patient absolutely depends on excluding septic invasion, without the confidence that a faultlessly equipped laboratory gives. And yet I recall a case of classical recovery, in a grave condition of intestinal obstruction, where a small resection of ileum was performed on a kitchen table, in a picturesque thatched cottage, with an earthen floor, whilst some newly hatched ducklings disported in a shallow pan of water at one's feet, and near the open door the

*An elaboration of the writer's "Choice of Antiseptics," *The Prescriber*, Edinburgh, 1914.

reek of a dung heap was wafted at intervals across the path of illumination. In this case instruments were boiled, and the patient's and operator's skin purified with 1 in 1000 of biniodid of mercury solution in about 65% alcohol, and as aseptic swabs and dressings were not available, those employed were steeped in the same solution. This was twenty-two years ago, before the common use of rubber gloves or the employment of iodin.

The possibility of adding an additional margin of safety for both "clean" and infected cases is the object of this paper.

Methods for the prevention, or for the combating of sepsis fall into two main groups: (1.) The indirect, or those methods employed to raise the defensive resources of the tissues against bacterial invasion. (2.) The direct, or those methods employed to inhibit or destroy the invading bacteria. In the first group, weapons are frequently laid aside in reserve, until too late to secure their maximum benefit. They consist of the constitutional treatment of any condition tendering to lower the vitality and resistance of the tissues. Principally, these are the use of vaccines, sera, etc., and the avoidance of shock at the time of operation. The latter principle has been systematized in recent times by Crile of Cleveland with great success.

In the second or direct group of methods, which aim at inhibiting or destroying the invading bacteria in situ, much has been done in standardizing principles.

There is little to add to purely surgical principles of relief of pressure on the dying tissue-cells by incision or drainage. There is perhaps a modern tendency to minimize the indication for drainage, unless that indication is most obvious. This arises from the apprehension of the possible complications of scar tissue following in the tract of the drain. "When in doubt, drain" is, however, always a safe axiom, for subsequent adhesions may then usually be planned where they will do least harm, and are always better than risking the vagaries of uncontrolled adhesions.

Local medication of septic areas, perhaps, calls for the most revision. Continuous irrigation with saline solutions, preferably hypertonic, is logically sound, for toxins, bacteria, and cellular débris are thereby washed away, and the tissue-cells receive a stimulating influence, but the difficulty that confronts the surgeon is that, except in the minority of cases especially adaptable to this treatment, there are so frequently pockets and surfaces in apposition that escape the benefits of the constant stream, and potentially are bathed only by a static pool of saline solution. The beneficial effect of saline lavage is in direct proportion to the rapidity with which it is carried to and removed from the infected site. With regard to the antiseptic effect of stagnant hypertonic saline, a disadvantageous factor, almost negligible in fast-flowing streams, becomes amplified enormously; this depends on the ebb and flow which takes place between the lymph and the saline solution, that although the tissues are depleted of their toxins, bacteria, etc., there is a return absorption, in ratio to the tonicity of the saline. Thus probably reinfection from bacteria occurs, and certainly reabsorption of toxins takes place. This ebb and flow can easily be demonstrated by addition of an aniline dye to the saline lotion. The reinfection, however, can practically be overcome by the addition of a suitable surgical antiseptic to the saline solution.

Until quite recently there seemed an inexplicable lack of interest on the part of surgeons in the varying value of antiseptics. Antiseptics were, and are still, largely selected for surgical purposes on an empirical basis, and frequently tradition alone is the sole reason for the employing antiseptics of high bactericidal value, but very low value for surgical purposes.

In 1914 I indicated how antiseptics might be systematically classified with certainty, giving their index of value for surgical purposes. There appears to be no substantial flaw in the principle of the method.

Briefly, it advocated the consideration of three factors in the selection of an antiseptic for surgical purposes: (1.) The bactericidal or Rideal-Walker index. (2.) The toxicity when carried by the blood stream. (3.) The harmful effect on living tissue-cells, (which may be approximately estimated by the power of the antiseptic to coagulate serum.) Thus, if the first factor is high, and the second and third factors low, the antiseptic is valuable for surgical purposes. Any deviation from this ideal makes the antiseptic proportionately of less value.

A fourth factor might now be added, that of power to penetrate the tissues. Much more valuable work may be done in this direction, but from observation it appears that aqueous solutions penetrate living tissues about equally, the solutions of volatile agents, such as chlorin and iodin, having a higher power of penetration than the solutions of the more stable chemicals.

The power of penetration is greatly enhanced by

solutions in alcohol. Solutions in 50% alcohol permeate the tissues to at least twice the depth of an aqueous solution. Higher percentages of alcohol further increases the effect but, as will be demonstrated later, beyond 50% strength alcoholic solutions commence to lose their potency as surgical antiseptics. There are probably many substances other than alcohol that increase the power of penetration, of carrying the bactericide to deeper parts, but alcohol appears to be the most satisfactory. To marshall these factors in order to secure a standard formula, to ascertain a definite value for any substance as a surgical antiseptic, it is necessary to determine: (1.) The bactericidal index, as obtained by the Rideal-Walker reaction; (2.) The systemic toxicity, found by animal experiments, so that any solution likely to be used for surgical purposes is known to be harmless; (3) The local devitalizing effect on living tissue-cells.

This last factor can be arrived at only indirectly, owing to the difficulty of obtaining living tissue accessible to experiment under standard conditions. Even if this were possible, graduations of devitalization short of a lethal effect would not be practicable. The capacity of a solution to coagulate serum follows very closely its capacity to devitalize living tissues, and by this method the finest graduations may be accurately recorded.

The method as suggested in 1914 is as follows: "A glass tube of 1 mm. bore is allowed to draw up about one inch of horse serum, and then an equal quantity of the antiseptic solution. If the mixture becomes cloudy, the antiseptic is diluted to such a point that no cloudiness or bright granular spots are visible in a strong light where the two fluids meet. The point of dilution which just ceases to give a reaction is noted." These factors being known, a vulgar fraction is framed, having its numerator formed by the Rideal-Walker index multiplied by 35 (the coagulation point of phenol), and the denominator formed by the coagulation dilution of the antiseptic under scrutiny. The resultant of this fraction forms a reliable standard index of the solution as a surgical antiseptic.

It is beyond the scope of this paper to dwell in detail on the surgical antiseptic index, classifying the legion of antiseptics into good, bad, or indifferent for surgical purposes. A brief comparison, however, of two such similar salts as bichlorid of mercury and biniodid of mercury may be instructive to illustrate the advantage of the principle of relying on the surgical antiseptic index, rather than upon the empirical use of a bactericide in surgery. The two salts are nearly equal in their bactericidal and toxic effects, inhibiting the growth of anthrax and most other organisms in 1 in 1,000,000 solution. Both have been popular for antiseptic use, in a solution of about 1 in 1,000.

In round figures, bichlorid of mercury coagulates serum in solutions of less than 1 in 8,000; while a solution of biniodid of mercury to which 4-5 of iodid of potassium is added fails to coagulate serum in 1 in 100 solution. This power of coagulating serum results in solutions of bichlorid of mercury destroying defensive tissue-cells, thus favoring fibrosis, and encapsulating clumps of attacking bacteria, thus rendering it an indifferent surgical antiseptic. Biniodid of mercury is free from these drawbacks, and is in the front rank of effective surgical antiseptics.

Probably the use of bichlorid of mercury has done more to influence surgeons in avoiding antiseptics wherever possible, than any other factor.

If harmless but effective surgical antiseptics exist, and there are many such to be garnered from the vast number of bactericides by the method suggested for standardization, does it not behoove us to consider the advantage that may be gained, in dealing with "clean" cases for operation, by incorporating such antiseptics with sterile water, saline solutions, local anesthetics, etc., and thus securing a further margin of safety in case possible slight faultiness of aseptic technic should arise? It is doubtful whether any procedure aimed at thorough asepsis, can ever be absolutely perfect: but by the addition of a suitable antiseptic, as defined here, the ideal may be more nearly reached. In patients of low vitality this extra precaution may mean everything.

The same rules that apply to the recognition of beneficant surgical antiseptics, apply also to their solvents. Usually the solvent is water, but to secure additional penetration alcohol may be employed. It is found that 50% is the maximum strength in which this may be employed without coagulating serum, and damaging living tissue cells.

These notes are in no way intended to adversely criticise the use of coagulating media, where actual destruction of tissue is aimed at, as in the destruction of a zone by zinc chlorid, with subsequent removal, as recently advocated by Babcock of Philadelphia.

In conclusion, to select haphazard antiseptics for surgical use is often to select bad ones, and having done so, to disparage them as a class—which is un-

fair. To take advantage of any means that will graduate bactericides with certainty, according to their surgical value, will place the difficult problem of combating sepsis substantially nearer its solution.

THE DIAGNOSIS AND TREATMENT OF NEPHROLITHIASIS.

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Nephrolithiasis occurs more frequently in men than in women, and although found in every decade, a large percentage of cases occur in the third and fourth decades. Many theories have been advanced as to the cause—among them being that lithiasis is bacterial in origin, that it is due to the slowing of the urine flow in the kidney and that deposits are formed in the ureter from back pressure of the urine and then float back into the kidney. I believe that the majority hold to the belief that calculi are bacterial in origin. C. H. Mayo[1] in a recent paper said that "stone formation is evidently the results of the combination of two types of bacteria: the first creates an infection with minute necrosis causing mucoid exudate; the second factor is the elimination at the same time of the stone-forming bacteria that may come in contact with the mucoid material. If the stone originates in the cortex of the kidney, its growth will be slow, but if it originates in the calyces or the pelvis, growth may be more rapid, because of the ease with which its chemical material is secured."

The disease is usually unilateral but bilateral in ten to twelve per cent. of all cases. The stones may be single or multiple, large or small; the large ones usually occurring in the pelvis of the kidney.

Renal colic plays a minor rôle in the diagnosis of stone in the kidney proper; colic rarely occurs unless a stone passes into the ureter. However, a large stone in the pelvis may plug up the mouth of the ureter and produce typical renal colic. The pain is more often a dull soreness in the back, on the affected side and referred down the ureter to the penis and scrotum. Occasionally the pain is more severe and comes in paroxysms or may be referred to the sound side. Hematuria may occur from a stone in the pelvis most frequently after it passes into the ureter. It is usually mild in type and rarely becomes an alarming symptom. After the stone has been present for some time, there may be recurrent attacks of pyelitis with severe pains in the back, rigors, sweats and pyrexia of the intermittent type. It is usually at this stage that we find quantities of pus in the urine.

Diagnosis should never be made without the aid of roentgenography and cystoscopy. Suspicious shadows on the *x*-ray plate should always be confirmed by a second plate giving the same number of shadows with the same relative positions, before a diagnosis is made. The cystoscopy, ureter catheterization and pyelography, should determine the exact condition of both kidneys as to function, amount of pus, size of each pelvis, etc.

Having secured these data, the next thing to consider is the treatment of the disease, and as there is no medical treatment for it, we must consider whether to operate or to pursue a course of watchful waiting. Braasch[2] has outlined some very important points to be considered before operation is recommended. They are: 1, duration of symptoms; 2, size; 3, situation; 4, number of stones; 5, certain types of bilateral lithiasis; 6, low renal function; 7, complication in other organs.

In considering the duration of the symptoms, we must remember that about seventy-five per cent. of renal stones will pass spontaneously, and a large majority of these within the first three to six months after the onset of the symptoms, if we allow nature to take its course. So immediate operation for stones should be strongly condemned, unless the case is one of long standing, or one in which there is severe infection of the kidney, or the symptoms are so acute as to demand it. However, when it is evident that the stone is too large to pass, nothing can be gained by delay even though the onset of symptoms is very recent. When the stone is shown by the *x*-rays to be less than 2 cm. in diameter, it is well to delay operation some time, in the hope that it will pass, as there is considerable destruction of kidney substance in the search for such a small stone in the renal cortex. In the case of indefinite symptoms with uncertain shadows, operation should not be considered.

Stones in the calyces or the renal cortex cause less damage to the kidneys. Hence the urgency for operation is not so great. However, with multiple stones in the kidney, regardless of the size and situation, it is usually advisable to operate, since the time for the passage of so many stones may permit much damage to the kidney. In about fifteen per cent. of the cases, stones occur in both kidneys and these should be studied thoroughly before advising operation. If the symptoms are not acute and the stones in both kidneys are large and multiple, necess-

itating much destruction of the kidney tissue in removal, operation is not advisable, as these patients will usually live as long and as comfortably without an operation.

A careful test of the function of both kidneys is the most important consideration of all before operation, as to how radical we may be. In unilateral nephrolithiasis with good function in both kidneys, we, of course, consider a lithotomy of some type. However, should there be a low function in the affected kidney while the other is normal, and we find pyonephrosis at operation, we may with a feeling of safety do a nephrectomy. On the other hand, if the function of both kidneys is low, we must be more conservative. It is surprising to see how much the renal function will improve and the pelvic infection clear up following the removal of stones from a kidney. In case of chronic nephritis or glycosuria, operation is usually inadvisable unless the symptoms are very acute.

Lesions in other organs are frequently found coincident with nephrolithiasis and very often on account of more acute symptoms they demand attention first. Among the more common of these are, appendicitis, cholecystitis and prostatitis in the older male patients.

A very careful study of each individual case should be made and a thorough preoperative treatment carried out. The patient should have a non-nitrogenous diet with forced fluids for ten days to two weeks preceding the operation, and should be given the benefit of repeated functional tests of both kidneys as well as a series of *x*-ray pictures, giving an accurate diagnosis of the size and number of stones, and their relative positions.

The lumbar incision is to be preferred for good exposure. There are three methods for removal of stones—pelviolithotomy, nephrolithotomy and nephrectomy, each of which have very definite indications. None of us should become too radical or too conservative, nor when we are conservative should we favor one type of operation altogether. Let each case be considered individually, and given that type of operation which sound surgical judgment teaches us is best.

Of the two conservative operations pelviolithotomy is usually done with less destruction of renal tissue and with less hemorrhage than nephrolithotomy. In many cases, however, the stones are more easily accessible through the cortical incision and excessive hemorrhage is avoided by compression of the kidney pedicle between the thumb and forefinger of the left hand while the incision is made along the convex border, just posterior to Brodel's line which is the least vascular portion of the kidney. When stones can not be felt, this incision is desirable for exploration, and causes less destruction of the renal tissue than repeated acupuncture as adopted by some. The ideal thing is to have a portable fluoroscopic machine of the army type, which is placed alongside the operating table and, after the kidney is lifted above the skin surface, have the roentgenologist point out the stones with an aseptic glass rod. If he finds that there are no stones, which often happens, we thus avoid the added risk of an incision of the kidney. Those of us who do not have these ideal arrangements must use the exploratory incision, which is easily closed by Halsted mattress sutures through the kidney substance, and running sutures along the capsule which usually control all the hemorrhage. In all pelviolithotomies, we should cover the suture line with a pad of fatty perirenal tissue, as a reinforcement, and in this way prevent many urinary fistulas. Occasionally, however, we have to drain these incisions into the pelvis and the kidney, and this is best done by rubber tissue. In the cleanest cases where the kidney and pelvis are sewed up, we consider it best to drain the perirenal tissue with rubber dam. As a general rule, we consider that pelviolithotomy is indicated in all cases of a single stone in the pelvis, and a few cases of multiple stones that are easily accessible through the pelvis. But in nearly all cases of multiple stones, we prefer nephrolithotomy.

In many cases, especially of pyonephrosis with stone, nephrectomy becomes imperative, and in many other borderline cases where conservative operations are done, excision of the organ finally becomes necessary as a secondary operation. Of course, we must be sure of the presence of another kidney with good function before nephrectomy is done. Primary nephrectomy is much less difficult than secondary nephrectomy following conservative operations. The operation may be done by removing the whole kidney or by the subcapsular route, which gives free access to the vessels so that they may be ligated separately. These cases usually do so well that there is little regret after the removal of the entire kidney. Conservation should be the keynote to all of our work in nephrolithiasis, but we must always be radical enough to get results.

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FRACTURES.

A Comparison of End Results from the Standpoint of Treatment.

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Fractures constitute a formidable part of a surgeon's work. The questions always arise: Does the broken bone ever become as strong as it was before? Just what method of procedure shall we follow in any given fracture?

We have the enthusiast in this as in every line of surgical work, who endeavors to reduce all fractures by some set method, and he proclaims its value. To illustrate, in one center we find a large fracture clinic where the director insists that all fractures should be treated by the closed method, for he believes that any fracture, not compounded, can be reduced, retained in proper alignment and properly healed by simple manipulation and application of splints of one sort or another. On the other hand, we find in a distant center one who would cut down on all fractures and after properly apposing the ends, retain them in situ, by some substance, autogenous or foreign. Therefore, we face the question: "Shall it be open or closed treatment?" Opinion changes from time to time.

Emphatic opinions generally come from men of wide experience and from those who are surrounded by a great amount of fracture work in an institutional environment. There they are actuaries for a large hospital, are backed up by the prestige of a teaching position in some medical school and have acquired an unassailable reputation. The word of these men is accepted as the last in this work and the results they obtain are not questioned.

In this connection there is an important factor to consider. Watch any man work along a certain line about which he is very enthusiastic and you will see that he has become very dexterous in his movements. Let him be replaced by an assistant, even well acquainted with his teachings and special methods and immediately you notice the marked difference. The time consumed in completing the work, the detail in technic and the end-results will vary. In other words, if we could all develop the same touch and dexterity, the same degree of muscular control, the same eye for line, and the same self-confidence, we would get the same results. We cannot all do this, no matter how much time we give or how much material is at hand. Some of us can never hope to equal the enthusiast.

No doubt there are those of you who have had the pleasure of observing such men as Jones of Liverpool, Lane of London, Claremont of Vienna, and Albee, Sherman, Cotton, Scudder and many others of America. How dexterous these men are and how certain they feel of result from their special method! How many of us can develop the personal touch of Jones, the ultra technic of Lane, the energy and accuracy of Claremont and the great ability and natural gifts of these others in our own country? To us ordinary men it is quite impossible.

How many of us are in rural sections, far away from centers where the many things necessary for these varied methods are at hand! Then again, how

Fig. 1. Case No. 21-56. Complete double fracture, right radius and ulnar; before reduction.

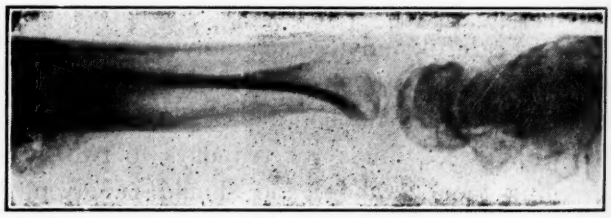

Fig. 2. Case No. 21-56. Complete transverse fracture, right radius and ulnar; after reduction, closed method.

many of us see our patient only every third or fourth day! It is often a long drive to the patient, and often without assistance must we reduce the fracture and make the best of it. For hours during each day, and for days at a time, the patient is beyond our control.

Le us first sum up the ideas of the fracture-treatment enthusiasts or specialists. Recognizing their statement as a fact, we can still glean the best from the various methods and perhaps develop ourselves to a point, slightly beyond the average, and gain a wide horizon and permit the individual case in each fracture to determine for us the special method of procedure. Without opportunity to develop especial skill in any of the methods we must not limit ourselves to any one.

It may be rightly stated that no two fractures are alike. Visualize twenty fractures of any given part of the body as shown by the roentgenogram and

observe how different they all are. For instance, look at radiograms of ten fractured shoulders. In one, the head of the humerous remains in the glenoid cavity, the fracture is just below the anatomical neck, the lower fragment is driven into the upper and held there. In another the fracture is at the surgical neck, the humeral head is rotated outward and is not in the glenoid cavity. Yet another case shows the head of the humerus pushed outward and the lower fragment upward so that the shaft rides by the spiculated portion of the upper fragment. Here we have three forms of the same fracture but they cannot be treated alike with equally good results.

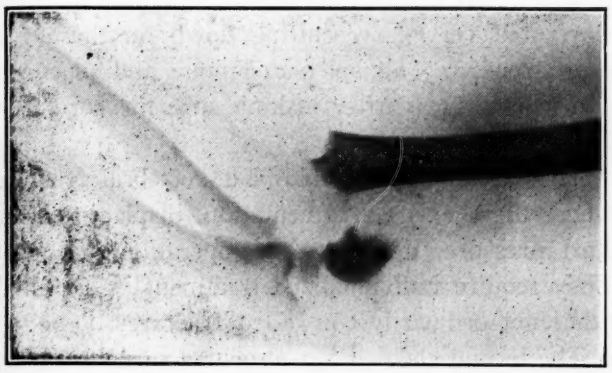

Fig. 3. Case No. 21-44. Complete transverse fracture lower end of right humerus; before reduction.

Fig. 4. Case No. 21-44. Complete transverse fracture, lower end of right humerus; after reduction, closed method.

Take forearm fractures. Some occur high up, others low down and again the middle third may be involved. Some of these fractures may involve both the radius and ulna; others may present a transverse fracture of the ulna, while the radius fracture is oblique. One fracture may be markedly displaced and the other very little if any. One fracture may be low down in the ulna, and the radial fracture higher up. Some of these fractures show markedly separated spicules of bone which, unless removed, would interfere with healing. Again, in very muscular individuals to retain the fracture ends in alignment with the ordinary splint is quite impossible. This attempt may be repeated several times with failure and one must resort to the open method.

If we pass to the ankle and lower leg, we are very apt to meet fractures wherein the bones are markedly spiculated and fragmented, displacement is pronounced and deformity marked. We also see fractures of the lower leg and ankle where there is not any marked displacement, spiculation, fragmentation or surface deformity. Fractures of this locality often have separated bone fragments which, unless removed, become sequestrated and later form a nucleus for irritation and continued trouble, even sinus formation which persists until the sequestrum is removed. How differently must we treat these fractures. No two can be treated exactly alike. Not

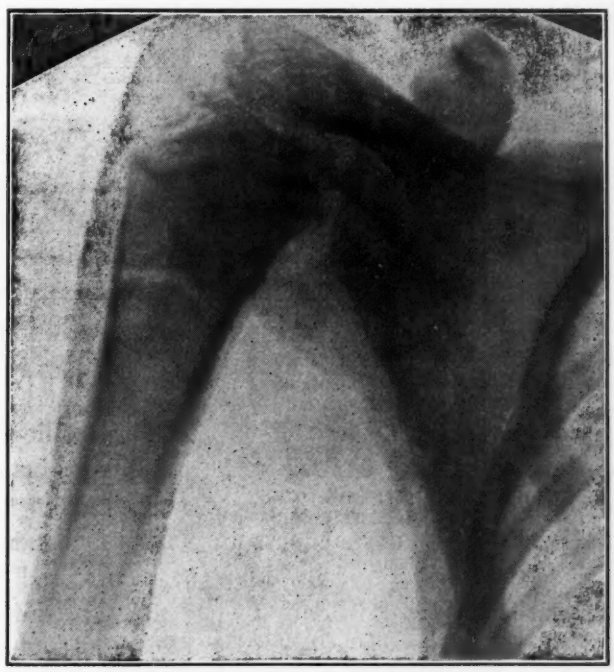

Fig. 5. Case No. 21-57. Complete transverse fracture, surgical neck of right humerus; after reduction, closed method.

all will do well by the closed method of reduction and some must be pinned, others sutured, some require inlay grafts and others must have bits of free bone removed before they will heal well.

The small bones of the wrist and ankle demand special study. Often when these bones are fractured the parts remain in good apposition, relatively speaking. These cases require little more than retention in some form of wire or wooden splint or plaster cast and rest and Nature will do the healing and give the desired results.

Again there are fractures of these short bones with a good deal of fragmentation and resulting deformity. Radiograms show a good deal of displacement, one or two pieces of bone forced away from the parent center and acting as a foreign body between fragments of the same or other bones. This might occur in the astragalus, os calcis or the os magnum.

In such instances open treatment is indicated at times and the true outline cannot be restored unless this is done.

On the other hand, there are fractures which are more or less classical in type and require, as a rule, only a standard treatment, and that treatment is usually by the closed method. There are fractures of the clavicle, ribs, skull and vertebrae (especially of the latter when above the sacrum). A fracture of the clavicle will heal fairly well and minus any very marked deformity, without any special treatment. I dare say that many of these fractures would heal quite readily and perfectly if the patient merely lay flat on the back and remained so for a

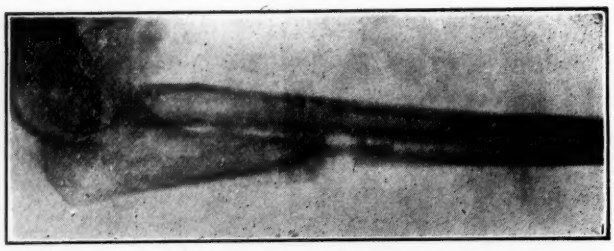

Fig. 6. Case No. 21-54. Complete transverse fracture, left ulnar. Non-union after 6 months. Open treatment: medullary autogenous bone peg.

period of 14 to 21 days. Few people are willing to do this, however. As a substitute for this we inaugurate an ambulatory treatment consisting of the Sayre dressing for retention and Valpeau bandage for reenforcement. This may be considered as standard, for these fractures when they are simple, and it will ordinarily give very good results without any deformity except possibly a very small tuberosity at the point of fracture which will generally disappear after a time.

However, even with these classical forms we now and then meet a deviation from the average. One end or the middle of the clavicle may be so broken as to markedly fragmentate and set aside small pieces. These require removal. It is this deviation from the average, or the compounded fracture of the clavicle, or one perhaps in a very muscular person where the muscular contraction develops such a leverage that the ends cannot be aligned, which necessitate open treatment.

Turning to fractures of the ribs, generally we have to deal with a classical condition. Merely moulding for reduction and retention by firm strapping will usually suffice and give the desired results in from 14 to 21 days. Compound fractures of the ribs and the spiculated fractures which pierce the pleura or even the lung, require open treatment and maintenance by sutures or other method.

Vertebral fractures may generally be included in the classical group. Here are two conditions involving the vertebral column: those with displacement and pressure symptoms; those where there is a fracture but no displacement to the degree of producing pressure on the cord. In the first instance, of course, the prognosis is grave at best. We must immediately so replace the bone fragments as to release the cord if this is possible. Immediately following this release by as nearly normal alignment as possible a proper retention apparatus or cast must be applied and the patient kept very quiet, recumbent or prone. Recent works of our foremost men have warranted very early cutting down on these fractures, removing all spiculated bone and placing in situ a bone graft after making sure the cord is relieved of all pressure.

Thus it might be stated that vertebral fractures, where there exists fragmentation, displacement and cord pressure, demand open operation and graft. They require individualized treatment as do all the other not ordinarily controlled fractures.

The second class of vertebral fractures are generally classical and come under standard treatment. These are the cases where fracture exists but without fragmentation, displacement or pressure on the cord. These cases, of course, as those of the former class, are determined by radiogram. If the patient is put up in a well fitted plaster jacket or other form of firm retention apparatus and given perfect rest for a considerable time he will get well.

In fractures of the skull we are dealing with two factors insofar as treatment and the end-results are concerned.

So far as treatment is concerned the simplest skull fracture is one minus depression and brain injury. Of course, the shock of the trauma will produce certain signs and symptoms from which, without the existence of depression or basal conditions, the patient soon recovers. We may consider a simple skull fracture without spiculation or depression as "classical" and demanding a standard treatment which, after all, is more medical than otherwise and might be easily summed up in the word "rest." The location of this type of fracture directly governs the prognosis but does not materially alter the treatment.

When, however, a skull fracture produces stellated spiculation or depression, or both, the condition immediately enters the operative field. The indicated procedure is to remove or elevate the depressed bone or spicules and the earlier this is done the better.

Thus there are certain fractures involving certain regions of the body that are classical and require standard treatment: fractures of the skull, clavicle, and ribs. Fractures of other parts of the body framework are not classical in any sense and the treatment cannot be standardized. Each case is in itself an individual one and requires special study and some one of the various methods will prove best in each case.

None of us can afford to treat, in every instance, all of our elbow, forearm, femur, leg, wrist or ankle fractures according to the text book of any one author. We must adapt our treatment to the individual condition that we meet. Our minds should go back to the days of tree grafting as boys on the farm, to the carpenter work taught us in manual training during school days, to the correctness for zone lines in drawing and surveying, and to the physics laboratory of our high school.

Fig. 7. Case No. 21-59. Complete transverse supracondyloid fracture left femur; before reduction.

Some cases demand open treatment while others will be well treated by the closed method. If we elect the closed treatment we may select board splint, fiber splint, wire or mesh splint, hinged splint, card board or plaster or one of the numerous other materials. We may feel, by studying the case carefully, that the type of splint should be exchanged for another after a week or two.

If we elect open treatment we may think that a band, wiring inlay bone graft, medullary bone graft, heterogenous bone plate or peg, steel pin or nail, animal gut suture or even coaptation of spicule with spicule will be best.

The suggestion from some author will assist, our recollection of other cases will guide, yet it is the special circumstances before us that will rule. The best end-results lie in lessened surface deformity, good alignment and position, return to as nearly as possible perfect function and good union. If we get these, we, as well as the patient, must be satisfied.

In fracture therapy there are some conditions which must not be overlooked: the presence of tuberculosis or lues, any tendency to osteomalcia or lack of proper calcification, and lastly the age of the patient. We must always guard against these liabilities by a thorough physical examination and laboratory invertigation in so far as possible. Systemic or local tuberculosis, syphilis or bone softening causing pathological fractures must be treated systemically as well as locally.

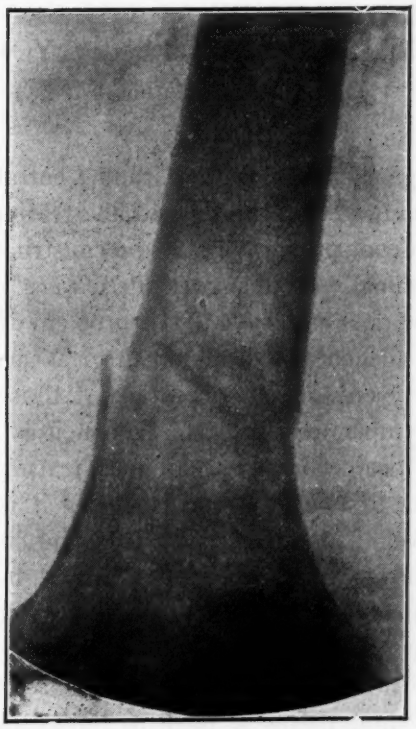

Fig. 8. Case No. 21-59. Complete transverse supracondyloid fracture of femur; after reduction, closed method.

Finally, the proper instructions relative to hygiene, diet, and general right living are important. The administration of thyroid extract or other lime stimulating drugs should at least be considered.

Fracture	Classical	Standard Treatment	Specially elected treatment Open or closed	End Resuls
Skull	Yes	Yes	Occasionally	Good if brain tissue is intact
Vertebrae ..	Yes	Yes	Occasionally	Good if spinal cord is intact
Clavicle	Yes	Yes	Occasionally	Good
Ribs	Yes	Yes	Occasionally	Good

Bones of face	No	No	Yes	Good
Shoulder ...	No	No	Yes	Good
Humerus ...	No	No	Yes	Good
Elbow	No	No	Yes	Variable
Forearm ...	No	No	Yes	Good
Wrist	No	No	Yes	Good
Phlanges ...	No	No	Yes	Good
Pelvis	No	No	Yes	Varied
Hip	No	No	Yes	Generally Fair
Femur	No	No	Yes	Good
Knee	No	No	Yes	Variable
Patella	No	No	Yes	Good
Leg	No	No	Yes	Good
Ankle	No	No	Yes	Variable
Phlanges ...	No	No	Yes	Good

NOTE: Classification of joint or anatomical part of place of naming bone allows for wide variation in type of fracture or capsular involvement.

EMERGENCY WORK AT THE GRAND CENTRAL TERMINAL, NEW YORK.*

D. H. M. GILLESPIE, M. D.,
NEW YORK CITY.

Emergency work at the Grand Central Terminal was inaugurated at the time of the tearing down of the old depot preparatory to the construction of the new terminal. In this work there were on an average 3,000 men employed. The problem of supplying prompt, adequate medical and surgical care for these men early engaged the attention of those in charge of this stupendous project. When it is considered that the project involved not only tearing down the old depot of one level and replacing it with one of three levels four times its capacity and changing the motive power from steam to electricity, but also carrying on this work with practically no interruption in traffic day or night, it will be seen that there was a fertile field for accidents and all the more necessity for some means at hand to render prompt and efficient treatment of those so injured.

The problem was quickly solved by the establishment of a first aid and dressing station on the grounds. For this purpose an old baggage car was utilized and placed on a siding in the Grand Central yard. The enterprise quickly outgrew its quarters and when the old Grand Central Palace was taken over for a temporary depot two rooms were set apart for this purpose, opposite the station master's office and fitted up as waiting room and surgery. It was in these quarters that many of the victims of the memorable explosion on December 19, 1910, were treated. Originally intended merely as an institution for emergency treatment of those injured in the work of building the depot, it soon became necessary to widen the scope of its activity. There were then received cases of illness, occurring among the employees in the office and yard, passengers going to and fro and even those who were neither disembarking nor intending to become passengers.

The first aid room, now grown to the proportions of a dispensary, was then utilized also as a place in which to conduct examinations of employees, both those applying for the first time and those seeking promotion; later on, after the passage of the law requiring the yearly examination of food handlers, it was decided to have all the dining car employees examined here. This examination was designed to detect particularly cases of infectious and venereal diseases. This work was turned over to those in charge of the first aid room and the examinations were and are now conducted every four months and no man is allowed to work on the diners nor at the commissary of either road unless he can prove to the examiners by a physical examination that he is clean and free from such diseases. Thus we can assure the traveling public who patronize our diners of the physical and moral cleanliness of those who prepare and serve their food.

In July, 1911, the new station, or "terminal" as it was to be known, was far enough advanced in construction to allow the fitting up of quarters for what was now to be known as the Emergency Hospital. These quarters are on the second floor of the main building and consist of three large rooms, each 20x25 feet, subdivided into waiting room, surgery, consultation office, examining room, rest room, and isolation room. The windows have a westward exposure and there is an abundance of air and light. The plant is equipped to do rapid work and handle several cases at practically the same time. Only minor surgery is attempted. The hospital is becoming known in the neighborhood, which is so rapidly changing into a region of large hotels and office buildings. The hospital is open and ready for business at seven A. M. and closes at six P. M. There is a doctor present at least six of these eleven hours. This has brought many cases of illness or injury not only from our own large office building, but also from other office buildings in the neighborhood, as well as from the neighboring hotels and drug stores.

Originally there was one doctor to handle all the work, but he soon found that there was more than one pair of hands could do, so first one and later two assistants were obtained. In the fall of 1908 there was a reorganization. A committee of three was appointed by the railroad to effect this, and to handle the affairs of the hospital. The committee

*Read at the 31st Annual Session of the N. Y. and New England Association of Railway Surgeons.

consisted of the claims attorney, the operating general manager and the chief surgeon. Upon the resignation of the former doctor in charge, this committee appointed the writer and his colleague, Dr. William P. MacLeod, to carry on the work and we thereupon arranged a schedule of hours so that we each could serve a certain number of hours at the hospital, and a certain number of hours on hurry call and have the balance of the day for ourselves for our outside work. This arrangement has continued for thirteen years and by it service can be obtained at any hour, day or night. During the hours on hurry call we are supposed to reach the hospital in from twenty to thirty minutes after the call is received. During the daytime rarely more than fifteen minutes elapse. I believe that the hospital is becoming better known every day, not only to the railroad men and traveling public, but in the neighborhood as well.

It is very evident from the foregoing that there must be great and wide variation in the character of cases treated. First and foremost, of course, there is the slight laceration, either (and most frequently) of the hand or finger, of the foot or toe, or of the scalp or face. These cases may come to us either clean or fresh or after any variety of home treatment, including the ever-present peroxide, but seldom the sensible iodin. If such a case comes already "treated" we may see any grade of infection from slight reddening to a copious purulent discharge, with extension of the process by the lymphatics to include adenitis of the nearest group of lymph nodes.

It may seem overdrawn to say that this can actually occur in this year of our Lord, 1921, after all the teaching the layman has had, but it does occur and occurs frequently. It happened to me personally no longer than last week. I dwell on this class because it is perhaps the most frequent class of injury that we see and it might well be used as a text for a sermon on "First Aid—What It is, What It isn't, and What It Should Be." I lay stress on these cases also for the reason that they are very numerous and in them we have obtained some of our best results and have done this by conservative methods. Many times a finger or even a hand has been saved by this plan of treatment, which formerly would have been at once amputated. The next class in frequency probably is the bruise of some part of the head, extremities or trunk. This may or may not be accompanied by an abrasion of the skin and injury to the deeper parts. Here, too, we see the patient very frequently after he has applied so-called "First Aid," which usually consists of a liberal application of iodin—which, of course, precludes the proper treatment of such a condition without the risk of blistering the skin, *i. e.*, the application of a wet dressing. The next class in frequency is the strain. This may involve a joint, a muscle, a group of muscles or any combination of these three elements. The joint most frequently sprained or strained is the ankle and the muscles most frequently the site of a strain are those of the back. In this latter injury we frequently see a strain of the ligaments of the lower spine, or of one or both sacroiliac joints as part of the injury. This class of injury most frequently comes to us without previous treatment, but the sad part of it is that it also comes to us very frequently several hours or even days after its inception. This adds to the difficulty of securing prompt relief. The next in frequency is the class comprising foreign bodies in the eye, real and imaginary. This class of cases is one that the amateur delights in treating and these cases therefore come to us frequently in a state of advanced irritation or even inflammation of the conjunctiva. Frequently, also, two or three days elapse before the case appears for treatment, allowing plenty of time for the foreign body to become firmly embedded.

The above classes of cases constitute the most frequent cases we see. In the course of a year we get all the various injuries of a more serious character, such as fractures, dislocations, various forms of head injuries, penetrating wounds, traumatic amputations, serious joint injuries, etc. On the medical side of the question we have most all the minor ailments imaginable, as well as occasionally the more severe types of medical conditions. I believe that I am not overstating it when I say that with the exception of the infectious and exanthematous diseases we have seen and handled in this hospital since 1908 almost every medical and surgical condition to which the human being is heir. We have even had maternity cases.

In the treatment of our cases our main idea is simplicity and we show a tendency to let nature do what she will. This has given rise to conservatism to a marked degree and we believe has led to the preservation of many a finger or toe that would have otherwise been sacrificed in the beginning to obtain a neat surgical result. Our materia-medica is extremely limited and perhaps old fashioned. We have tried and discarded many of the new and highly touted aids to quick recovery and rely mostly on the

old-fashioned cardinal principles of surgery. Bruises and contusions are treated by the application of hot, moist dressings, especially the venerable, but highly satisfactory lead and opium lotion, which the patients are instructed to keep moist by frequent immersions in a warm bath. Sprains and strains are strapped and the strapping left alone usually for a week. At the end of this time it is sometimes necessary to re-strap, but usually all strapping can be discarded and massage with a good, strong liniment and passive motion instituted. Open wounds are treated with iodin after a thorough immersion in a weak antiseptic solution and, as a rule left open. Occasionally a fresh, clean cut is sutured. These wounds are almost always dressed with a wet dressing and for this purpose we use aluminum acetate. Here again the patients are instructed to keep the dressing moist by frequent immersions in a warm bath. Open wounds coming to us infected are subjected to prolonged immersion in an antiseptic solution. For this purpose we use mercuric cyanide one to five thousand (1-5,000) or a weak solution of creoline. This immersion lasts from one to three hours daily and in very bad cases it is done twice daily. In addition to this the patients are instructed to keep the dressing moist by immersions in warm baths at home. In the dressing of these cases as well as some of the clean ones we frequently use Dichloramine-T. In the dressing of all wounds we endeavor to avoid getting our fingers into the wound and we use instruments extensively rather than gloves. In the later treatment of such wounds we use boric acid ointment and balsam of Peru as healing agents. In the treatment of burns we have lived throught the series of different waxes and have gone back to the old-fashioned Carron oil as an early and boric acid ointment as a further dressing. Waxes are used only for special cases where there is a likelihood of deep scarring. In treating our fractures, roentgenograms are taken freely and when necessary the patient is sent to a hospital where reduction and immobilization can be better brought about under a general anesthetic. In the after-treatment, especially in those fractures near a joint, we aim at early removal of splints and the institution of massage and passive motion. In a Colles' fracture, for instance, we begin massage and passive motion a week to ten days after the injury. Dislocations are rather rare accidents with us. We have had more dislocations of the shoulder than of any other joint. We have had no hip, ankle or knee dislocations, except as parts of more serious injuries to the extremities. Immediate reduction is adopted in all cases, followed by immobilization. Foreign bodies in wounds are removed, if easily located, and such wounds drained. If not easily located, roentgenograms are taken and if the case is one that requires a general anesthetic it is removed to a hospital.

Our results seem to be very good. Of course we are dealing with a class of men who are generally healthy and therefore have good resistance. We rarely have an infection get away from us and it is rare indeed that a wound coming to us clean becomes infected. We are able to see our cases every day if necessary and the same man dresses them each time. This may be responsible in a good measure for our results. While we have had some very stormy experiences and some prolonged cases, in no case that I can recall where we have had the sole control of the case have we been forced to sacrifice an extremity; and in only two cases that I can recall have we been forced to amputate a finger.

As to the number of cases treated in the last thirteen years, I submit the following table, showing the new cases and dressings in separate columns treated during each year; 1913 will be seen to be the high point in new cases and 1916, dressings:

	New Cases	Dressings
1909	787	2015
1910	1309	3982
1911	1686	4947
1912	1810	5389
1913	1984	6305
1914	1293	4916
1915	1352	5068
1916	1807	6315
1917	1930	6281
1918	1546	5684
1919	1624	6274
1920	1732	5552
1921 to Sept. 30	941	3400 to Oct. 1, '21

In conclusion I wish to record the fact that this work has all been done, including the necessary history taking and recording, Dr. MacLeod and myself, with the sole assistance of a man we have trained to act as sort of hospital steward. We had had no nurse. As in all other departments of railroad management it is hard for us to foretell what the future holds. We feel that the hospital has won for itself recognition by the railroad management and a place in the community. It is our hope that at some future date when the financial crisis for the railroads shall have passed we may be permitted to expand, especially toward the improvement of the night service and the employment of a nurse.

A PLEA FOR EARLY CLEFT PALATE OPERATIONS.

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KNOXVILLE, TENN.

For a long time the practice of surgeons was to delay operations for cleft palate until the child had grown, some recommending waiting until even as late as fifteen years. Each advocate, of course, presented certain plausible reasons in substantiation of his arguments, with the usual number of statistics as proof positive of his contention.

In spite of the many plausible reasons assigned for the late operations, some curious investigators began to challenge the dicta of the old masters, because of the unsatisfactory results—immediate and remote—following late cleft palate work. These new investigators, impatient of results in late operations, like intrepid explorers found new worlds.

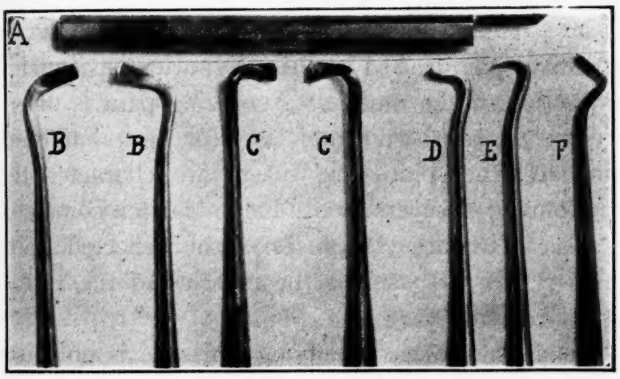

Fig. 1. The author's set of hare-lip and staphylorrhaphy instruments. A, knife for freshening the lip and nose fissure in hare-lip; BB, right and left periosteal elevators; CC, right and left periosteal elevators; D, E, F, periosteal elevators.

In consequence of a more scientific knowledge of the pathology of cleft palate conditions surgeons began advocating and practicing early operations. The effects of these early operations were to upset preconceived ideas, as to both the immediate cosmetic effects and remote results, such as more natural speech.

While a few surgeons may be found advocating late operations the trend of judgment at the present day among more advanced surgeons is to operate early in cleft palate cases, the earlier the better. Whether one repairs the palate first, or the lip first when it is involved, is immaterial in the present consideration, the object of which is to bring the latest ideas in cleft palate surgery before the general practitioner—he is the first to see these children, and should "inform his patients as to modern methods in the treatment of cleft palate" (Brophy). Cleft palate is not an arrested development, as formerly taught, but a fissure due to failure of union of symmetrical parts. For all practical purposes it is a fracture or wound. Would any sane doctor discovering in a newborn a fracture of the humerus or clavicle, recommend postponing treatment until the child was half grown?

The strongest argument for an early operation in cleft palate is that in the first two or three months of life there is a minimum of calcium salts in the bones, and on that account the bones can more easily be moulded into a more normal position.

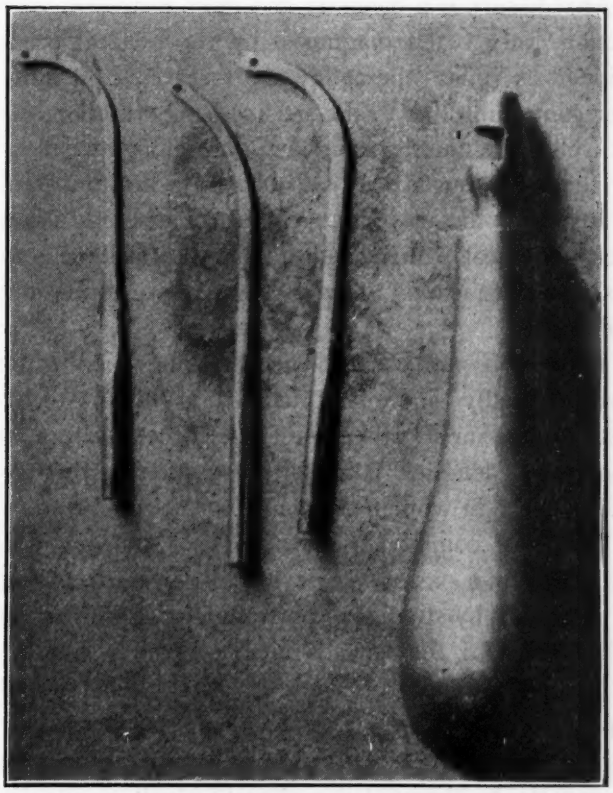

Fig. 2. Author's drills of different sizes and curves for carrying the pilot suture in Brophy's operation on the hard palate.

After six months, there is an excess of lime salts in the bones, which prevents easy manipulation. Again, if the cleft is closed before the child begins to talk, it will have a more natural voice, whereas if one waits until after the child learns to speak it will be a hard matter to entirely eliminate the nasal twang.

By early operation, the bones being moved into a more natural position, the teeth in the upper jaw erupt more normally and occlude more naturally with those of the mandible. If operated upon early the muscles develop, and a corresponding "good velum" is secured which functionates better. In fact, all the parts develop along more normal lines. A child born with a cleft palate is, as a rule, poorly nourished and is predisposed to inflammatory condi-

tions of the respiratory tract and adnexa. If operated upon early it will become better nourished and better able to weather the storms of childhood. Moreover, it is spared much embarrassment among its associates and is better equipped to make its way in the world.

FISSURE IN ANO. DIAGNOSIS AND TREATMENT.

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NEWARK, N. J.

Anal fissure is a common and most distressing affliction, very often diagnosed by the general practitioner, as "piles" the agony and torture of the sufferer continuing due to the spasmodic contractions of the sphincter muscle. Fissure is an elongated ulcer of the anal mucosa at its juncture with the skin. It is one of the most frequent of all diseases about the anus, most painful and annoying, attacking both sexes, the well-to-do as well as the poor, adults and children.

The lesions are parallel with the long axis of the bowel, usually single and located at the posterior anal commissure. It varies from three-quarters to one inch in length. When situated anteriorly, it usually occurs in women that have borne children.

The most common cause of fissure ani is constipation, from a passage of scybala, or over-stretching of the anus by divulsing the sphincter, resulting in a laceration of the mucous membrane, which is arrested at the muco-cutaneous junction. The second type is produced by the detachment of a semilunar valve. Each action of the bowels causes the torn mucosa to be dragged downward, which eventually extends the rent to the skin, and the mucous membrane becomes edematous and the skin inflamed and swollen, forming the "sentinel pile," in the center of which is the fissure. The sentinel pile is the chief cause of errors in diagnosis. Physicians on seeing it often make a diagnosis of hemorrhoids. The innocent victim of this mistaken diagnosis is put under an anesthesia and the pile is removed. To the surprise of the physician and patient, the condition is aggravated and the suffering is increased by an additional ulcer.

Other causes are prolonged straining at stool, caused by diarrhea or dysentery, foreign bodies passed from above or put into the rectum, ulceration of the rectum, rectal masturbation, and careless use of the nozzle of a syringe in giving an enema.

The tear of the mucous membrane causes a spasm of the sphincter and great pain. At times nature makes an attempt to heal, when the sphincter is at rest, but at each succeeding movement of the bowels, the wound is opened and nature's attempt destroyed. The disturbance of the wound causes a sharp burning pain, sometimes bleeding, and the severe pain lasts for two or more hours after stool. The pain is so severe that the patient dreads to have a stool, and he allows himself to become constipated. When the stool passes the pain is aggravated, and the irregular action of the bowels, constant irritation and lack of food, cause the patient to become emaciated and debilitated, and he develops an anxious, careworn look.

Symptoms.—In a recent fissure the edges are clear cut, it bleeds frequently, and the pain, which is of a burning character, subsides shortly after defecation. In chronic fissure the anus is tight and drawn upward, the sphincter muscle is hypertrophied, the ulcer is very sensitive to touch, the edges are inflamed and thickened, and the patient experiences a sharp burning pain following defecation.

The stretching of the fissure during stool induces very sharp pain caused by the intermittent spasmodic contraction of the muscle. Agonizing pain is often referred to the sacrum and lasts for hours. These pains and the sphincteric spasm are characteristic symptoms of fissure in ano. Patients often complain of vesical irritation because of the reflected pain which causes a spasm of the muscles of the recto-vesical region.

The discharge accompanying a fissure is not profuse but is enough, often, to cause an annoying pruritis. Patients suffering from fissure are very nervous, at times melancholic, due to the severe pain and loss of sleep. The patient defers moving his bowels on account of the pain during defecation, which results in constipation. Fissure in ano is often mistaken for other affections of the anus, but this is unnecessary, for a fissure can be brought into view by separating the buttocks and margins of the anus. In women, everting the anus by putting the finger in the vagina easily exposes the fissure.

Foreign bodies may enter the fissure, or an abscess may form from infection, often resulting in a blind or complete internal fistula.

Treatment.—The non-operative treatment of fissure is rarely curative. Keep the ulcer clean. Apply a 2% solution of procain (novocain) or spray with ethyl-chloride and then use locally an application of 5-25% of silver nitrate solution every day, or in place of silver use ichthyol, 10%, or balsam of Peru.

Ointments, soothing lotions, powders and rectal suppositories have been used, but all with poor results; the Paquelin cautery has been successfully

used in some cases. The most gratifying result, the quickest cure of fissure in ano is by operation. Divulsion of the sphincter is very painful and if the patient will not take a general anesthesia, local anesthesia must be used.

Inject procain into the sphincter and the surrounding tissues, and gradually dilate by the fingers which must be well lubricated. Forcible divulsion under a general anesthetic is to be preferred, but if instruments are used great care must be taken not to damage the sphincter muscle.

Pressure must be brought to bear in all directions and at least five minutes should be consumed in dilating the sphincter muscle. Cure is obtained by the above method by causing relaxation of the muscle, which relieves the spasm of the sphincter, and prevents contraction, and the wound is given a chance to heal. Local applications should be made every second day.

Incision.—Division of the sphincter muscle can be done by means of local anesthesia. Incision or division of the sphincter is unquestionably the operation of choice, the muscle regaining its activity before the wound is healed, when the procedure is properly performed and the after-treatment is carefully carried out. The incision of the sphincter muscle must be complete to get the best results; partial division usually fails. The fear of incontinence following this operation is very much exaggerated. I have never seen a case of incontinence following proper incision of the muscle. The patient, previously prepared, is placed upon a low table in the lithotomy position, or upon his left side with his legs flexed. The buttocks are held apart by an assistant; a syringe holding one ounce, is filled with the procain solution. The needle is introduced between the layers of the skin and sufficient amount of the solution injected to produce a whitish swelling, which indicates anesthesia at that point. The needle is then inserted further and further until the skin from the point of entrance up to the anal margin has been anesthetized. The external sphincter and posterior rectal wall for a distance of about two inches are now injected and anesthetized in a similar manner.

Always use a sharp bistoury, and cut down through the fissure and the sphincter muscle, but always at a right angle with the transverse fibres of the sphincter muscle. Remove the sentinel pile, when present, and have the incision extend about a half an inch beyond the anal margin, so as to get proper drainage. Lightly pack the wound with iodoform gauze to prevent bleeding, then cover with a guaze pad, which is kept in place by a T-binder. The wound must be allowed to heal from the bottom, and should be dressed daily. After the first week the gauze is moistened with ichthyol or balsam of Peru to stimulate healing. These patients are allowed out of bed, and permitted to eat whatever they choose. They should have daily a semi-solid stool. Of the three operations, division, excision, and incision, the last is the simplest operation for the permanent cure of fissure. It can be quickly, painlessly and safely performed in the office or at the patient's home, by means of local anesthesia. The advantages of this operation are: it relieves contraction of the muscle, effects a cure, can be performed in a few minutes, is not dangerous, no general anesthetic is required, nor is the patient confined in the hospital; it permits perfect drainage of the wound, and obviates the danger of fistula; the after-dressings can be quickly and quite painlessly inserted.

841 SOUTH 12TH STREET.

SURGICAL CLINIC

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GALL STONES IN THE YOUNG.

This woman, 21 years old, was admitted to the Misericordia Hospital on January 1, 1922, referred to me by Dr. J. C. McConaughey. She complained of general abdominal pain. She had had pneumonia at the age of one and typhoid fever at the age of eight. There had been no irregularities of menstruation and no discharge.

She stated that she had been suffering from attacks of abdominal pain at irregular intervals during the preceding year. These attacks usually occurred during the night and were often so severe as to awaken her. They began with severe pain in the epigastrium and with a feeling "that there was a lump there." By forcing herself to vomit she would secure relief.

When I examined her there was neither pain, nor tenderness in the gall-bladder region; her abdomen was somewhat distended and decidedly tender in the right lower quadrant. She had a leucocytosis of 19,400.

About one hour and one-half after her admission (about 5:30 P. M.) I opened her abdomen through a right rectus incision, Dr. A. E. Burke assisting. After I had removed an acutely inflamed appendix, I found that there was nothing palpably wrong with the pelvic organs, kidneys or stomach but that she had an enormously distended gall-bladder. I enlarged my incision and performed a cholecystostomy, removing five or six stones about the size of hazel nuts. I drained the gall-bladder for two weeks. As you can observe, her wound is now entirely healed. The pathological report on the appendix was: "Acute appendicitis with beginning gangrene of the mucous membrane."

Occasionally the surgeon encounters gall stones in

a young patient—usually when operating for some other condition. Recently I did a cholecystostomy in a man of 26. He had an acute appendicitis for which I operated and after I had opened the abdomen I found his gall-bladder filled with stones. He never had had a symptom of gall-bladder involvement. The patient whom we are discussing now, however, has had several attacks of gall stone colic according to her history.

E. R. McGuire (*Surg., Gynec. & Obstet., Dec.,* 1920) in a series of 252 operations on the gall-bladder found that in less than 15% of the cases the patient was under 30.

C. G. Heyd (*Surg. Clin. of North America,* **1**;499, April, 1921) discovered gall stones in a woman of 26. Several other operators have had the same experience. Gall stones in patients under 35 years of age are, however, unusual. D. Adams (*Jour. A. M. A.,* **76**, 710, March 10, 1921) in a report of 230 cases of gall-bladder disease found the average age to be 44.

If the gall-bladder wall is thin and healthy I do not do a cholecystectomy as I am not entirely convinced that the gall-bladder has no function. I know that stones can recur in the common duct as well as in the gall-bladder, and that such recurrence in the latter situation is an easier problem to handle surgically. If, however, the walls of the gall-bladder are thick and diseased, the gall-bladder should come out.

TWO FRACTURES OF THE SKULL.

These two young women were in an automobile which collided with one of the standards supporting the elevated railway. When admitted to the Misericordia Hospital, at 2:30 A. M., May 12, 1920, they were both unconscious.

Miss L., who was 19 years of age, was bleeding from the left ear and had a laceration above the right eye. Her temperature was 96° by axilla, her pulse 80 and her respirations 20. Her skin was cold and moist. Treatment for shock was promptly instituted.

The spinal fluid obtained by lumbar puncture was under high tension and contained blood. The patient reacted from shock, but did not fully regain consciousness. Dr. T. J. Byrne examined the left ear and found "the external meatus filled with blood crusts mixed with a muco-purulent discharge." "The drum examination shows an old perforation, kidney-shaped, involving the lower quadrants with small granulations anteriorly and superiorly. Judging from the character of the discharge following the accident, the patient has a fracture of the horizontal portion of the squama—especially that portion entering into the formation of the tegmen tympani, as there is no roughness or evidence of recent injury in the lower plate or tables of the squama entering into the formation of the bony roof of the external meatus." "From the character of the discharge, the thickness of the edges of the perforation and the presence of granulation tissues, the perforation of the drum is an old condition."

Dr. C. P. O'Boyle's interpretation of the roentgenogram of the skull was: "Fracture of the right parietal bone, extending almost perpendicularly to within about two inches of the petrous portion of the temporal bone." Here, then, we had a fracture of the right side of the vault complicated by an old otitis media of the left ear. Six hours after the accident the patient's temperature was 98.6°, pulse 88 and respirations 26. She was semi-conscious, had no paralysis, no eye symptoms. She could be aroused but immediately thereafter would lapse into a state of somnolence.

The other patient, Mrs. M. M., was 23 years of age when she met with the automobile accident. When she was admitted to the hospital she was unconscious, with a temperature of 97°, pulse 100, and respirations 30. There was a deep laceration in the right parietal region extending into and exposing a depressed fracture. She had multiple contusions and abrasions about the face and head and, as she reacted from shock and became partially conscious, she vomited about three fluid ounces of a dark bloody fluid.

Lumbar puncture was performed; the cerebrospinal fluid was under tension and contained blood.

Dr. C. P. O'Boyle's report of her roentgenographic examination was: "Depressed fracture of the right parietal bone. The fracture is branched and extends almost to the posterior portion of the temporal bone. The line of fracture extends horizontally, slightly downward and forward." This was a case of compound, depressed fracture of the vault. About seven hours after the accident, Mrs. M.'s temperature was 100°, her pluse 108 and her respirations 32. She was semi-conscious and could be aroused with some difficulty. There were no palsies. Her pupils reacted slightly to light and not at all to accommodation.

The various examinations mentioned above consumed some time, so that it was eleven hours after the accident when I operated upon Mrs. M., who, apparently, was the more seriously injured of the two. I excised the laceration of the scalp, and turned down a large flap, exposing the right parietal bone. The depressed fragment was then elevated and removed and a circular area of dura excised. There was considerable oozing of blood from beneath the dura. The parietal bone itself bled inordinately, so much so that I reluctantly left between the bone and dura a small piece of gauze. I sutured the scalp, leaving this small piece of gauze to protrude through an angle of the flap. Five days later, the patient being under nitrous oxid anesthesia, I removed the gauze. Four days after the operation the patient became entirely conscious, answered questions intelligently and was able to swallow. Twenty-one days after the accident she was up and about in a wheel chair. About this time she complained of a queer sensation in the right arm and hand, and I requested Dr. E. A. Strecker to examine her. His report was:

"No mental agitation noted. No confusion, no amnesia. No evidence of post-traumatic psychosis. I am not sure but am inclined to believe that the difficulty with the right arm is a functional condition. There is no significant loss of power, no reflex change, no vasomotor change, no atrophy, and the paresthesia is not typical of a peripheral nerve lesion." Soon afterwards the patient was discharged from the hospital.

Immediately after I had finished operating upon Mrs. M., I trephined Miss L. at the site of fracture in the right parietal bone. I removed a small spicule of bone which had been detached from the inner table and had been driven into the dura. I decompressed the brain and found blood under the dura. Dr. E. A. Burke assisted me in both of these cases. The patient continued more or less stuporous for five days following the operation, and then began to clear up mentally. From then on she gradually improved. A rather persistent conjunctivitis of the right eye was treated successfully by Dr. Louis F. Love. She was in the hospital a few days longer than Mrs. M., because of her chronic ear affection which I decided should receive regular treatment. Before Miss L. left the hospital Dr. Strecker examined her and decided that there was "no organic nerve or mental sequellae". Over a year-and-a-half following the accident both these patients present themselves here today (January 30, 1922) in good physical condition.

Deeming that a mental and neurological examination of these two cases, at this late date, might be of some value, I requested Dr. E. A. Strecker to give me his opinion of their present status. He examined both of them on January 17, 1922, over eighteen months after the accident.

Concerning Miss L. he states: "There are practically no sequellae in a neurological sense. It is true there was a slight tremor of the outstretched hands and an exaggeration of the knee jerks, but I do not believe that they are results of fracture. There is very slight tenderness over the site of the operation. Hearing is slightly impaired on the left side; the tuning fork being heard only at a distance of about six inches, but air conduction is better than bone conduction. I should say the person was mentally perfectly normal. Certainly there has not been any personality change. She claims slight memory difficulty, but I doubt whether it actually exists." Doctor Strecker then suggested another *x*-ray examination, which was made by Dr. C. P. O'Boyle on January 23, 1922. The result was negative.

In regard to Mrs. M., Doctor Strecker reports: "As in the first case there seems to have been a very good surgical result. Neurologically this patient shows nothing definitely abnormal. The Romberg sign, the increased reflexes and the tremor of the hands and tongue can, I think, be discounted in the absence of any evidence of organic neurologic disease. However, there has been apparently a definite personality change. She is "more nervous" than she was before the accident. In general she is also apathetic and indifferent, with occasional periods of pronounced irritability. The circle of her interest has narrowed. For instance, she does not sing or dance or play the piano, all of which she did before the injury. She has had a number of so-called 'spells.' These spells consist of what the mother describes as fainting and unconsciousness. For varying periods of time, occasionally for four days, she is mute, retaining urine and feces and does not take nourishment beyond swallowing liquids which are placed in her mouth. I doubt very much indeed that these spells are epileptic. To me they sound very much like hysteria. It is not unusual to have an hysterical sequela following bad trauma. I feel that the prognosis in this case is a matter of very grave doubt and I should not be surprised to see her develop outspoken mental disease." He then suggested another roentgenogram, which has been made by Dr. O'Boyle, January 23, 1922, and found negative.

We have long known that head injuries may be followed by mental derangements varying in intensity from the most inconspicuous change in character to the frankest outburst of insanity. Even a surgeon may be able to recognize acute mania, but who but a skilled alienist can recognize the outward manifestations of the most subtle change in the brain? I believe that all cases of head injury should be examined by a skilled neurologist and psychiatrist, not only before being discharged from the hospital, but also at a period more or less remote from the date of the trauma.

Depressed Fracture of a Very Thin Skull.

P. N., a student, 17 years of age, referred to me by Dr. P. T. Moylan, was admitted to the Misericordia Hospital, April 5, 1921, complaining of "fainting spells" and "headache." He suffered from scarlet fever when a small child, but otherwise his medical history was negative.

On March 4, 1921, he was engaged in playing baseball. He was pitching and ran forward to catch an "infield fly;" the catcher also attempted to field the ball; the result was a collision, the forehead of the catcher coming in contact with the left parieto-occiptal region of the patient. The patient suffered a slight degree of concussion, "saw stars," was nauseated, but did not become unconscious. He was kept in bed for two days, after which he was apparently well until March 24, 1921, when, while descending the stairs, "suddenly everything became black" and he lost consciousness. He was with companions who prevented him from falling. When he regained his senses he developed a severe headache. He was unconscious, he learns, but a few minutes. On April 2, 1921, he suffered a similar attack, also lasting but a few moments. There was no headache following the second attack.

When he came to the hospital his appetite was good; his weight was ample for his height; he had no eye symptoms. A complete physical examination proved absolutely negative, except in regard to his head. About 15 cm. above the left ear there was a depression in the skull. Slight pressure on this area

caused "a queer feeling". The *x*-ray report of Dr. C. P. O'Boyle was: "Depressed fracture of the left parietal bone; the entire skull is extremely thin."

On April 6, 1921, a flap of scalp was turned down over the fracture and the depressed area of the bone was excised. The bone was very thin for the parietal region, but apparently healthy, as it bled freely on section. I then decompressed the brain. Beneath the dura there was no free bleeding, but several small, dry clots were washed out with normal saline solution. Scalp suture. Dr. A. E. Burke assisted me. Operative recovery was without incident.

When I saw the patient on January 21, 1922, (over nine months after the decompression, and over ten months after the injury) he complained of "pains shooting backward from the eyes after reading". There have been no epileptic seizures at any time since the operation; there have been no headaches when the patient was not engaged in reading. He has gained in weight and his general health is excellent.

Dr. E. A. Strecker who also examined him on the same date reported: "He complains of headaches of the linear variety, beginning at about the site of the supraorbital emergence and directed back to the operation site. They are intermittent. He also complains of eye fatigue and black spots in front of eyes. Neurologically there is nothing abnormal noted of any account. There is a slight Romberg sway. The hearing in the left ear is defective, but this is probably due to scarlet fever, which he had in childhood. Mentally he seems normal. He complains of defective memory, but I do not think there is any real difficulty." Dr. William T. Shoemaker found nothing wrong with his eyes except a slight refractive error, which was corrected by glasses.

This is my first experience with fracture of an abnormally thin skull. Dr. J. Cambers DeCosta told me of a case, within his recollection, in which the skull was of the thinness of cardboard and in which a slap on the face produced meningeal hemorrhage and death.

PIN IN THE APPENDIX.

M., age 18, chauffeur, was referred to me by Dr. J. F. Hilly, with a diagnosis of chronic appendicitis. When admitted to the Misericordia Hospital on December 14, 1921, he complained of soreness in the right lower quadrant of the abdomen. He had his first attack of pain in this region six weeks previous to his admission. At that time, according to his statement, the pain was of a "sharp, shooting" character and radiated to the epigastrium and back; the attack lasted but one day. The third attack, the one which brought him to the hospital, was December 14, 1921, and lasted but a few minutes. He vomited during the first attack only.

When I examined him his cecum was distended and he had decided tenderness in the right iliac fossa. There was slight rigidity of the lower part of the right rectus muscle. He was a well-nourished male of good musculature, who, aside from having chronic appendicitis, was in good physical condition.

On December 15, 1921, a right rectus incision revealed a thick, indurated, slightly curved appendix, about 3 inches long. "Tough" is the adjective which will describe its consistency. Its end was bulbous and from the adhesions about its base I judged it to have been the seat of long-standing inflammation.

At the laboratory, while making sections of the appendix, an ordinary pin was found imbedded in its wall, parallel with its long axis. Dr. A. E. Burke and I utterly missed the diagnosis which was made exclusively by the laboratory, where so many startling discoveries are made. The report of the pathologist was negative as far as carcinoma was concerned.

The patient's recovery was uncomplicated and he was discharged from the hospital December 25, 1921. He has no recollection of having swallowed a pin.

Quite recently, S. A. Mahoney (*Boston Med. & Surg. Jour.*, February 3, 1921) has reported a case of pin in the appendix and reviewed the literature on foreign bodies in this organ. The following statements are collected from his report. A pin is the most usual type of foreign body encountered in the appendix. Pins are found more often in males than in females (2 to 1). They are found most frequently in children under 10 years of age. Cases of pins in the appendix are comparatively rare—only 40 pins in 160 years, possibly in 228 years, if the case of Ruysch (1691) is considered the first case. There are only 86 cases of true foreign bodies in the appendix mentioned in the literature. Among American observers cases of true foreign bodies range from about 0.2% to 12%. Among foreign observers this percentage is higher—as high as 50%—probably due to the fact, as Mahoney thinks, that these authorities classify fecal concretions as foreign bodies. Since Mahoney's report, G. Kelling (*Zentrallblatt für Chirurgie*, June 4, 1921) records a small screw found in the tip of a long appendix.

PRIMARY EPITHELIOMA OF THE ANTRUM OF HIGHMORE. REPORT OF A CASE*

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Malignant disease of the upper jaw is fairly common, but *primary epithelioma* of undoubted origin with the antrum is a very rare condition. This fact, together with certain interesting circumstances connected with the case have prompted me to report it.

A man 60 years of age, watchman, was admitted to my service in Gouverneur Hospital on January 23, 1922, with the following history:

He has always enjoyed good health and does not recall ever having been sick enough to be confined to his bed. He uses tobacco sparingly and formerly was a moderate drinker.

*Read before the N. Y. Academy of Medicine, Laryngolical Section, April 26, 1922.

He denies ever having had syphilis. Wassermann reaction negative.

Four weeks ago he had lancinating pain in the right side of his upper jaw, which he attributed to a first molar, the only tooth he had left in his upper jaw, so he had this removed. He thought that this relieved the pain somewhat, but since this time he has had a discharge of muco-pus from the root cavity.

The right side of the face seems slightly swollen, but is not painful to the touch.

Examination of the nose shows slight congestion of the turbinates and increased secretion on that side.

Examination of the mouth shows that all of the teeth are missing from the upper jaw. From the socket of the right first molar protrudes what appears to be a small teat-like process of granulation tissue; from this spot there is a discharge of sero-pus. The odor is offensive. A bent silver probe can be introduced through this alveolar opening into the antrum, where it seems to meet with spongy resistance. *X*-ray examination shows the right antrum opaque.

The patient was etherized with the intention of performing a radical operation for empyema of the antrum. The opening in the alveolar process was enlarged and with a curette several pieces of tissue were removed from the interior of the antrum, which even to the naked eye had the appearance of malignancy; they were preserved for the pathologist. In enlarging the opening it was noted that the bone of the alveolar process was very friable and soft. A tentative diagnosis of malignant disease of the antrum was made and the patient was removed from the operating room to await the report of the pathologist and to prepare for a more radical operation in the event that this diagnosis was correct.

The specimen was examined by Dr. Symmers, pathologist of Bellevue Hospital and Dr. Cotter, pathologist of Gouverneur Hospital, both of whom pronounced it epithelioma, with numerous microscopic abscesses scattered throughout the growth.

Preliminary Operation, February 12th: The right external carotid was tied about on a level with the greater cornu of the hyoid bone. A careful search was made at this time for enlarged glands, but none was observed. The patient did not take the ether well and was not in a condition which we felt would justify our proceeding to so radical an operation as the removal of the upper jaw, so we decided to wait until the next day.

Second Operation, (Removal of the Superior Maxilla), February 13th: The patient was in excellent condition and in good spirits. Apparently he had recovered completely from the operation of the day before and was experiencing no ill-effects from the ligation of the external carotid. He was first put under the influence of ether by the drop method. A rubber tube was then introduced into the pharynx through the left naris and the ether vapor was pumped during the entire operation.†

Fergusson's incision was the one used. This consists in making a cut down to the bone reaching from the right inner canthus along the naso-facial fold, and then along the naso-labial fold, then through the entire thickness of the lip at the philtrum. A cut was then made from the beginning of the previous incision at the inner canthus along the lower border of the orbit to a point about one-half inch beyond the outer canthus. The flap thus made embraced all of the tissues of the cheek down to, but not including, the periosteum over the anterior surface of the bone. It was turned back and wrapped in gauze soaked in warm saline solution. The periosteum over the entire floor of the orbit was elevated and a flat retractor inserted for the purpose of supporting and protecting the orbital contents during the remainder of the operation. It will be noted that the periosteum over other parts of the bone was not saved but was removed with the specimen. An aneurism needle was then passed through the nasal duct into the nose and threaded; to this was attached a Gigli saw, by means of which the nasal process of the superior maxilla was severed. The aneurism needle was then passed through the spheno-maxillary fissure and out under the malar; with the Gigli saw, thus introduced, this bone was severed near its attachment to the superior maxilla, so as to preserve as much as possible the malar prominence.

The oral cavity having been packed with gauze, an incision was made with a right-angled knife along the border of the hard palate, separating the latter from the soft palate to the right of the septum. An incision was made through the muco-periosteum of the hard palate along the middle line to a point on the alveolus about corresponding to the former location of the right central incisor. With a stout nasal saw the hard palate and alveolus were severed along the line of the last incision. The superior maxilla was now held only by the pterygoid process of the sphenoid and the tuberosity of the palate bone. By firmly grasping the bone with my fingers, rocking it back and forth and cutting a few soft attachments, I succeeded in removing it. Hemostasis resulting from the ligation of the external carotid was so complete that it was not necessary to tie a single vessel except the coronaries. The operation was practically bloodless. I cannot imagine this operation being safely and successfully accomplished without this very useful preliminary procedure.

The bone, especially the alveolar process, was very friable. There was no apparent bulging or erosion of the antral walls, save at the location of the first molar, as has been mentioned. There was no evidence whatever that the disease had extended beyond the antrum. This cavity was about half filled with the growth which apparently had originated on its floor or outer wall.

The conclusion drawn from an immediate exam-

†This seems to me to be the best method for the administration of the anesthetic in such cases, for the anesthetist is out of the way and the naso-pharynx and larynx can be completely blocked off with gauze packing from the operative field in the mouth, so there is practically no danger of blood and mucus being drawn into the lungs. I may say here that I do not believe in preliminary tracheotomy in these cases, for this latter operation, in a patient of advanced age frequently results fatally through the induction of bronchopneumonia.

ination of the specimen was that the disease was in its very early stages.

It remained now to close off the nasal from the oral cavity and to suture the facial wound so as to minimize the subsequent scarring and deformity.

Closing off the nasal from the oral cavity was effected in the following manner: The muco-periosteum was elevated from the remaining well side of the hard palate and a flap was made from the mucous membrane of the cheek where this was cut near the base of the alveolar process in removing the bone. This flap was sutured to the muco-periosteum elevated from the hard palate and, posteriorly, to the soft palate, which had been preserved. This made a very satisfactory palate which completely closed off the nose from the mouth, and it certainly had the appearance of a normal palate.

The suturing of the facial wound was done with horse-hair, and the cut edges were brought into such accurate apposition that surprisingly little deformity resulted. The periosteum from the floor of the orbit, which had been preserved, held the orbital contents in perfectly normal position.

The patient left the operating room in excellent condition and all felt that his chances for recovery were excellent.

Shortly after he recovered from his anesthetic, he became paralyzed on his left side and died about thirty-six hours after the operation either from cerebral hemorrhage or cerebral embolism. No autopsy was permitted.

Primary epithelioma of undoubted antral origin is an extremely rare disease, but both carcinoma and sarcoma of the upper jaw are fairly common. Joseph Beck of Chicago reports 19 cases of carcinoma of the upper jaw; of these only 2 are now living, both of whom having been subjected to the radical operation without the use of either radium or *x*-rays. Beck believes that in some of his cases the fatal issue was hastened by the use of these agents.

After reviewing the literature since 1898, I am impressed by the inadequacy of the various methods employed in the effort to control this disease, and I am in doubt as to which course offers the unfortunate patient the better chance for escaping death, whether it be radium and *x*-rays without operation or whether these agents should be used before and after a surgical effort has been made to remove the disease as completely as possible. An incomplete operation, I am satisfied, hastens the fatal termination. The mortality shown by the clinical reports is frightful and all methods are apparently unsatisfactory, though it would seem that radium in conjunction with operative measures should be the choice of treatment. The greatest service, and generally the only service the physician can render the patient, is in the early recognition of the disease.

Unfortunately cancer does not produce any specific signs or symptoms and it is seldom diagnosed, especially when it occurs in a bony cavity, until a tumor is developed and mechanical results appear. In this particular case the diagnosis was made early and while the disease was still confined to the antrum, and it was a great disappointment to all that the patient's life should have been ended by an accidental occurrence.

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A PIECE OF GLASS REMOVED FROM THE INTERIOR OF THE EYE AFTER THIRTEEN YEARS.

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In July, 1912, I read before the American Ophthalmological Society a paper entitled "A Piece of Glass in the Crystalline Lens." Three and a half years later, I described the case again detailing the condition of the eye at that date. It is proper to refer to these two papers as preliminary to the present report.

The case concerned a lad of 16, in whose hands a 2-ounce vial filled with percussion caps, taken from large paper torpedoes, exploded. He was thrown to the floor and was partially insensible for a few moments. When picked up, there was found, in addition to lacerations of his left arm and face, a cut on the right side of the bridge of his nose, and the right eye was bloody. He noticed at once that the vision of the right eye was blurred. I saw the patient a few hours later. This occurred on November 29, 1908.

When I saw him there was slight edema of the edge of the right upper lid; the eyeball was pink

*Died May 27, 1922.

and there was a cut in the sclera 2 to 3 mm. from the margin and 4 to 5 mm. in length, slightly crescentic. The foreign body evidently came from above and slightly inward. There was no iridodialysis, and the interior of the eye could not be seen on account of the blood. The *x*-ray picture could not be taken at that time as there was immediate necessity of removing the prolapsed iris. This was done under chloroform and the forceps was thrust well into the wound in the attempt to find a piece of glass but without success. I did not push the forceps very far for fear of doing further injury. Atropin was used and the patient was kept in bed. Within a week or ten days numerous points, evidently mycotic in character, appeared on the cornea of the injured eye. They were destroyed by actual cautery at once. Later another crop appeared and they likewise were destroyed; but the corneal lip of the wound began to become gray and buckle. Subsequently a few of these points appeared on the left eye and they were treated in the same manner. At this date there is no sign of them on either cornea. I judged the foreign body was in the interior of the eye.

On January 5th, the eye being white, though the lip of the wound was slightly gray, roentgenogram was made by Dr. Dixon, and a foreign body was found to be in the rear and left of the lens. Shortly after this, the eye became "quieter." By transmitted illumination a dark smudge was seen in the region where the foreign body was, which appeared, of course, gray-white by oblique illumination: I thought I could see the rear end of the foreign body. The eye gradually became "quieter" and finally all irritation disappeared. I allowed the patient to go to school three months after the injury. He was not a hard student but I recommended light use of the eye. The remainder of the lens remained clear.

On January 1, 1909, his vision, with correction, was 20-40 minus; on February 23rd, 20-40; on March 11th, 20-40 plus; on April 7th, 20-30. On April 23, 1912, 3½ years later, 20-40 with correction. The smudge at the inner corner still remained; the rest of the lens was clear, but I was still convinced I could see the posterior tip of the foreign body indistinctly where it had been located. In October, 1909, I recommended that he go to school regularly. This he did and used his eye easily for 3½ years without any trouble. There was a pear-shaped pupil, the small end towards the nose, and the edges of the coloboma were practically parallel, both being slightly caught in the wound.

That brings us to the period of my paper read before the American Ophthalmological Society. The following is the peroration of my paper read at that time:

"The points of interest in this case may be summed up: A youth of 16 received a wound in the eyeball through an explosion; a small spicula of glass about 3 to 4 mm. in length, entered through the ciliary region, apparently just to the right of the ligament of Zinn; the iris was prolapsed and the prolapse was cut off. The eye became quiet at the end of about a month. After twelve months of rest the patient commenced to use his eyes at school in the ordinary way, and throughout the whole length of the time the vision ranged, under correction, between 20-30 and 20-40; the latter being the vision at this date. The eye is scarcely deformed at all; pupil is black, coloboma visible only under close inspection, and the patient has used his eye without any discomfort for two and a half years. Slight increase in opacification of the lens has occurred. The question arises: What is the future of that eye? I believe ultimate complete opacification of the lens."

From this time on the patient was seen by me at intervals, sometimes going as much as a year without inspection, the lens in the meantime remaining clear as in 1913. Within the last four years, however, a gradual diminution of sight commenced, coexistent with a beginning general lenticular opacity, and the lens became totally opaque. The eye then diverged, as was natural. Subsequently the lens began to shrivel and was finally absorbed, in the main, some light cortical substance remaining. Throughout the entire period, after dismissal, up to the incident which will be presently narrated, he was practically without any pain or inflammation, finished school, was in the army during the World War for six to eight months, where he occupied a clerical position, singular to relate, attended to his regular business, and read without restriction.

On July 1 and 2, 1921, he was swimming off the New Jersey coast, diving frequently. On the 3rd of July his eye became red, but he nevertheless went to the Dempsey prize fight on July 4th. I saw him on the 5th of July. One of my colleagues who saw him put cocain into his eye to relieve his pain. On the 5th I found his eye red, tearing, sensitive to light, painful and sensitive to pressure. There was marked iritis, contracted pupil with a patch of profound keratitis or infiltration below, covering about one-fourth of the cornea. The keratitis was so dense that it was difficult to see through it. The foreign body *appeared* to be in its original position in the lens, but I was unable to see clearly by reason of the inflammation and the patient's fear of light. I used atropin with some relief. The next day, that is on July 6th, after putting cocain in the eye thoroughly, I inspected the anterior chamber by oblique light. I was convinced I saw a foreign body at the bottom of the anterior chamber in spite of the exudate and keratitis. The same day Dr. E. S. Thomson saw the patient with me. He definitely affirmed he could see it. We decided, notwithstanding the inflammation, that an attempt should be made to remove it as soon as possible. To that end the patient was sent to the hospital that afernoon.

It was explained to the anesthetist that it was necessary to administer the narcosis as smoothly as possible for fear the foreign body might be dislodged and slip behind the iris. In order to make this less probable, morphin and atropin were given an hour beforehand. Instead of quieting him, the morphin excited him so that he was very unruly under the anesthesia. I feared that this might dislodge the foreign body. As soon as he was well under, oblique

examination with an intense electric light showed clearly that the foreign body had disappeared. We assumed it had disappeared behind the iris. The patient was allowed to come from under the anesthesia and I had the mortification of informing the family and the patient that the foreign body had moved. The patient went to his house the next day and at the end of five days, in the morning, I found the foreign body had returned to the anterior chamber. Though it was difficult to see, I nevertheless was certain of its presence. He was sent to the country for a rest, but was seen every three or four days. The glass remained in situ in the meantime.

My object was to wait for the keratitis and iritis to subside before making any further attempt to operate. On July 22nd, Dr. Percy Fridenberg and Dr. Herbert Wootton saw the case in consultation with me. Each one was certain he saw a foreign body at the bottom of the anterior chamber. We all agreed it had the appearance of glass, likewise in the necessity of an immediate operation. In spite of the keratitis and iritis, which, while it persisted, was slightly less, my consultants concurring, I decided to operate at once. That afternoon the patient was anesthetized without a preliminary hypodermatic injection. Chloroform was used first and then ether and the head was raised higher than in the preceding operation. I made the patient a strong suggestion immediately before the operation to let his last thought, before he became unconscious, be the necessity of restraining himself. The anesthesia was effected almost entirely without struggle. Dr. Frank Shine likewise convinced himself that the foreign body was in the anterior chamber and this was made abundantly clear by intense illumination with a condensing lens from a brilliant electric light. I determined once I had entered the anterior chamber to tilt the point of the knife slightly forward so as to pass to the front of the foreign body and to endeavor not to touch it. Fortunately the iris had always been slightly bombée. Standing behind the patient and using a very small cataract knife, I entered about 1 mm. behind the clear cornea and about 4 mm. above a tangent to the central plane of the vertical meridian of the cornea. The knife, being perfectly sharp, passed in front of the foreign body with ease and the counter-puncture was made in the same plane as the puncture. With two movements the section was completed practically in the same plane as the puncture just about the sclero-corneal margin inclining slightly towards the sclera. As the water of the anterior chamber flowed out, the outer, thick end of the foregn body shifted itself so that it hung about 1 or 2 mm. over the rim of the iris. I had hoped it would be evacuated with the escape of the aqueous, but it was apparently stuck tight below by exudate, of which considerable existed before the operation. The situation was extremely dramatic. It now became necessary to remove the foreign body with forceps. Standing behind the patient's head, I introduced a fine iris forceps, closed, sideways and, lifting the corneal flap slightly, opened the jaws and grasped the foreign body by its middle. In the attempt to withdraw it, the forceps slipped off. I reopened it without withdrawing it and grasped the piece of glass higher up, just short of the upper end, where the opposing services of the foreign body were found later to be practically parallel. Gentle traction brought it away without so much as entangling the iris in the hooks of the forceps. I noticed that the site where it lay on the iris was slightly gray. I took this to be caused by exudate. I dragged the glass into the lower cul de sac from which it was carefully removed and preserved. At the suggestion of Dr. Shine, I introduced the forceps again to see whether by chance any more glass remained. In this act I tugged slightly on the iris, but quickly relaxed my grasp without doing any apparent harm. We decided there was no more glass present and the anterior chamber having been irrigated with a normal saline solution, the eye was dressed as speedily as possible. I did not instill atropin. About an hour and a half before the operation, I decided to instill a 1 per cent. solution of eserin to contract the pupil, to some extent at any rate, to prevent the foreign body from jumping back again behind the iris, or to forestall the probability of this. Just before going under the anesthesia the patient felt no pain from the eserin, buf as soon as he came out he commenced to suffer excruciatingly. I allowed this to continue for several hours in the hope it would subside, but as it did not, I removed the dressing and introduced several drops of a sterile 2 per cent. solution of atropin. Within two hours the pain ceased. The next day he was entirely comfortable and remained practically without pain the rest of his stay in the hospital—a matter of ten days. Throughout this time the conjunctiva was irrigated with warm saline solution and whenever there was any discomfort atropin was used sparingly, but I became convinced the constant use of atropin irritated the eye. I believe by reason of the motion it created in dilating the pupil. I have observed this frequently in using atropin in iritis, particularly in iritis due to injury.

The patient remained at his own home in the city three or four days and then drove in a closed machine to his country place. As soon as he arrived in the country, his eye commenced to improve. I advised him to go there because I could not restrain myself from treating the eye in some way or other. In the country I advised him to do nothing but bathe his eye with warm, sterile water. I was becoming exhausted and I was afraid of becoming meddlesome. I believe healthy neglect was what he needed. Whether my judgment was right or not in this matter, the fact is I dismissed him on the 9th of August, twenty days after the operation, the eyeball being white and painless. I suggested the use of one drop of atropin every day or every other day, according to his judgment, until I returned from my vacation. The patient went to the mountains for his vacation.

A fear of light which persisted after the operation, coincident with constant treatment, ceased at once when he had gotten out of my hands, and the patient went about in a machine or afoot towards the end of the day. Throughout the bright part of the day, he remained indoors or under the shade of a tree. When subjected to strong light he used a plain

Crooks No. 2 glass with blinders. In the house and in the shade he used no glass.

Post-operative treatment in our surgery is oftentimes meddlesome and I have noticed that my patients sometimes do better when they get out of my hands. On my return from my vacation at the end of the first week in September I saw the patient again. The eye was white, the iris was nimble, except where it was caught in the lips of the first wound; the exudate in the anterior chamber had disappeared, the lenticular remnants had become absorbed, and the capsule was much thinner in two places, so that on ordinary inspection the pupil appeared almost dark. Projection was perfect and his vision was: movements of the hand. It was impossible to discover any scar where the section had been made. I attribute this to its having been made slightly in the sclera or as nearly as possible at the sclero-corneal margin. Before the operation, Drs. Wootten, Fridenberg and myself had all agreed the foreign body was of glass and were as one as to its shape and approximate size. The patient was seen for the last time on January 4, 1922. The eye was found to be in the same condition as heretofore stated and he was dismissed with the admonition that to be seen from time to time according to his judgment. Since the summer he has used his eyes freely in anything he desires to do, reading, writing, figuring by daylight or artificial light, without the slightest discomfort or pain. Moreover, the optic axes are parallel in distance vision and there is no divergence of the eye on reading.

The foreign body measures 5½ to 6 mm., from end to end, one being slightly less broad than the other; 2 to 2½ mm. in width; 1 mm. thick, perhaps a little more, at the thick end; and about ½ mm. thick at the thin end. Immediately near the thick end, and the one which hung over the edge of the pupil, the opposing edges of the foreign body are parallel, but towards the center, the edge which lay nearer to the nose, shaded off obliquely toward the thin end. This is probably the reason why the forceps slipped when I first grasped it by the middle, and the complete parallelism of the two edges towards the upper end, the probable explanation of the forceps holding when the grip was shifted to that point.

It is instructive to reflect for a moment upon the long sojourn of the foreign body within the eye and its final displacement at the end of thirteen years. It will be remembered that for practically more than half of the time the lens substance was unabsorbed. The foreign body imbedded in the substance was naturally held in place throughout that time; when, however, the cortical substance became largely absorbed, the position of the foreign body was less secure. The patient had frequently swum and dived before the occasion of the dislodgment, without disturbing it and without injury to the eye. The eye began to hurt him the day after diving from the raft for the last time. Whether the foreign body was dislodged at the time of the diving it is impossible to say, but the fact is, the irritation occurred the day after. It probably fell behind the iris, because it could not be seen in the anterior chamber on the 5th of July when I saw him for the first time, the cornea being sufficiently clear at that date for me to be sure of this fact. The use of atropin immediately on seeing him, caused a considerable dilatation of the pupil and lowered the height of the barrier behind which the foreign body was probably hiding. Some motion of the head must have caused it to leap over the barrier and drop into the anterior chamber. As already stated, it leaped back behind the iris during the first anesthesia. This was also readily accomplished by reason of the lowered barrier. These saltations and the insecure position of the foreign body in the bottom of the eye, involving a certain amount of motion, evidently caused the iritis and the exudate in the anterior chamber. The last time it landed in the anterior chamber it became fixed on account of the exudate, and that explains why, after the last leap, the eye became better and the keratitis less.

Throughout the conduct of this case, various occasions arose when exquisite refinements of judgment were necessary—when to withhold one's hand and when to operate; when to omit atropin and when to use it; how to quiet the solicitude of the family, to retain their confidence and justify it. It is fair to say the manual skill involved in the operation was considerable, and the instruments used were of the most delicate type. I believe the fine, thin, delicate knife used was a large factor in the success. The big, heavy Graefe knife, sometimes used in extractions, would certainly have struck the foreign body if it had been pushed across the anterior chamber. The removal of the glass with the forceps was the final tour de force. It was alarming when the forceps slipped off the center of the glass, particularly so since the very act of slipping caused the glass to rise toward the pupil over which it projected to the extent of at least 1 to 2 mm. Any struggle on the part of the patient at that moment would probably have brought about disaster and failure. It was caught just in the nick of time. The profound anesthesia was likewise a decided factor.

I cannot conclude the recital of this most interesting, dramatic and fortunate case without expressing my gratitude to, and my appreciation of the judgment and counsel of my friends, Dr. Thomson, Wootton and Fridenberg, of the narcosis administered by Dr. Booth, and the skillful assistance at the operation and counsel of Dr. Frank Shine.

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New York City

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GASTRO-INTESTINAL ROENTGENOGRAPHY.

In affections of the alimentary tract *x*-ray examination has become an important—sometimes, indeed, the decisive—part of diagnostic investigation. So active have been the developments in reducing diagnostics to visual demonstrations, and so enthusiastic have been the claims put forth for gastro-intestinal roentgenography, that some physicians have come to depend upon it. Pinning their faith on its infallibility, they are too apt to ignore clinical signs when the *x*-rays fail to support them.

To the average layman the *x*-ray is all-revealing; and the physician himself is always hopeful that it will demonstrate the location and nature of the disease in question. And so, too often, the roentgenologist feels that it is "up to him" to supply a diagnosis; and the less experienced he his the more regularly and the more cocksurely he does so. The very commonness of resort to these expensive and profitable gastro-intestinal examinations is, it seems to us, largely responsible for the over-production of commercial *x*-ray laboratories and of half-baked roentgenographists, unseasoned in roentgen interpretation and still less experienced in clinical medicine. How common it is to receive from them an impressively long and elaborate typewritten essay, fastened to a blue folder tied with blue tape, describing the position, shape and motility of the stomach, erect and recumbent, fluoroscopically and on the film and, like a military parade, the procession of the "head of the barium column" through the winding alimentary way, after one hour, after two hours, after six hours, after twenty-four hours—all of it quite normal and "revealing no pathology" and yet, mysteriously enough, leading its wise author to the abrupt finale: "Diagnosis—Chronic Appendix"! Sometimes our amateur arrives at this sage conclusion because the appendix appears a bit twisted, sometimes because the barium mixture enters it irregularly, sometimes, forsooth, because it does not appear to enter it all, sometimes because he notes "spasm of the cecum", sometimes because he is not pleased with the outline of the caput coli and is quite sure there must be "adhesions". The patient usually regards the *x*-ray pictures as photographs of his intestinal tract and is accordingly prepared to accept the report as a finality. So, often, does the physician, especially if it coincides with his own loose diagnosis of "chronic appendix", if he is without experience in roentgen diagnosis and is unable to interpret the films—if, indeed, he even sees them. We shall not now dilate again upon the observation that *most* cases of so-called "chronic appendix" are not instances of appendicitis at all and are usually unrelieved by mere appendicectomy. Every surgeon of experience must be convinced that the percentage of cases in which chronic appendicitis can be demonstrated roentgenographically must be small; yet how often the diagnosis is made by some of those who set themselves up as roentgenologists!

It is not many years since it was claimed that duodenal ulcer could be diagnosed roentgenologically by the observation of pylorospasm and increased gastric motility. Just as we have learned that the syndrome which Moynihan so insistently asserted was pathognomonic of duodenal ulcer may be produced by other conditions, so too, we have learned that this affection is not diagnosticable by these "indirect" *x*-ray findings. When the duodenum appears to be fixed and its outline dislocated and distorted, it may be drawn up by adhesions to an inflamed gall-bladder. If the roentgenographist makes this interpretative suggestion he will often prove to be correct; if he states it as a definite diagnosis he will often prove to be wrong! Elsewhere even more than in the duodenum the position and the movements of the gastro-intestinal tract vary much in different indivdulals and even in the same individual. One must be cautious in interpreting these variations. "Indirect signs" must be balanced against other diagnostic observations, else they will often lead to error.

What seems to us a rather fair view of "The Value and Limitations of Roentgen-Ray Diagnosis in Digestive Disease" is that of Ernest Gaither of Baltimore (*Journal of the A. M. A.*, August 19, 1922). Acknowledging the importance of roentgenography of the alimentary tract and admitting that it not infrequently discovers lesions otherwise undetected, he says:

All too often in the past have I been influenced by the roentgen-ray findings against my better judgment—a judgment based on the history, physical examination and clinical investigation; not infrequently have I been convinced of the presence of ulcerous, cancerous, syphilitic or tuberculous lesions, only to have the diagnosis denied by the roentgenogram, while subsequent course, operation or section testified to the correctness of the original pronouncement. Conversely, I have committed myself, on the word of the radiologist, to ulcers and cancers that did not exist. . . . . .

I am firmly convinced that most roentgen-ray manifestations are the result of those gross structural changes which come in the late stages of disease; on the other hand, a negative roentgen-ray finding does not by any means definitely rule out organic change.

Because of the inadequacies of this method, I would sound a warning as to the need of conservatism and of a well-balanced point of view which properly evaluates the findings by all the methods of investigation. No diagnosis should be made on one symptom; ergo, no diagnosis should be made by one method alone, and that mechanical.

Certain gross defects and deformities of the alimentary tract—penetrating ulcers, diverticula, hour-glass contractions, neoplasms, fistulous communications—are often, but by no means always, discernible roentgenographically, and the outlines of these abnormalities, competently observed and controlled, may be accepted as fairly diagnostic. It would be wrong, and ill-conducive to progress, to assume that gastro-intestinal roentgenography can not go beyond these clear demonstrations. Especially in the hands of a few men of vast experience, checked against observations at the operating and autopsy tables, it may make a high percentage of correct determinations even when the findings are not so clear that he who runs may read. Nevertheless, we join with Gaither in warning against placing much value upon "indirect signs". Roentgenography of the gastro-intestinal tract is quite different from that of the bones—and in osseous affections, too, wrong diagnoses are not rare! Variations in the shadowed outlines of the esophagus, stomach and intestines demand experience in interpretation. Not all of those who conduct *x*-ray laboratories are competent to make those interpretations!

THE WRITING OF MEDICAL PAPERS.

Members of a learned profession though they are, physicians in general do not write well. There are but few of them, relatively speaking, whose compositions are not in need of editing. Fewer still are familiar with all the requirements of a manuscript (or, as it might more properly be termed today, *typescript*) submitted for publication. As a single example of this, how common it is for authors to attach the legends for their illustrations to the pictures themselves (which are sent to the engraver), instead of at the end of their article wherefrom they may be set in type by the printer.

Some of us, of course, are quite unable to write well—either because of careless habits of thought and expression or because of lack of training in composition. They may be forgiven and deserve editorial indulgence; many a brilliant university graduate is a "poor speller"! Some, however,—and they do not deserve forgiveness—do not take the trouble, which they should, to revise their articles again and again, until they have eliminated all that is unnecessary and repetitious, and have expressed the remainder in clear, grammatical and well punctuated sentences. Some, indeed, do not even go over the final sheets to correct their typewriter's errors.

For the most part, however, medical authors desire to make their thoughts clear and to express them creditably or even elegantly. The chief faults lie, it seems to us, in the inevitable tendency to carry over into written language the crudities and slang of medical speech, and in the lack of available instruction on the preparation of medical papers. To be sure, some years ago T. C. Allbutt wrote a small book on "The Composition of Scientific Papers" (Macmillan) which is replete with sound precepts. Vizetelly's "Preparation of Manuscripts" (Funk & Wagnalls) is also old and does not deal with medical papers. The American Medical Association publishes a pamphlet on Bibliographic Style and one on Suggestions to Medical Authors that ought to be more generally studied. Occasionally, too, there has appeared in medical journals an article dealing with some phase or phases of medical composition. In a rather long editorial on "How to Write a Medical Article" (the JOURNAL, March, 1921) we, too pointed out in a spirit of good-natured satire the common faults in medical composition and the preparation of medical papers.* Aside from these scattered and more or less fragmentary instructions, however, there has not been, heretofore, any convenient and available guide on this subject. One has now appeared, and because it so well supplies what we believe to be a real want, we greet it in these columns with a fervent editorial blessing. It is a small manual on The Writing of Medical Papers, recently published by the W. B. Saunders Co. and written by Mrs. Maud

*The editor has a limited supply of reprints of "How to Write a Medical Article" for those who may care to read it.

H. Mellish, the editor of the Mayo Clinic publications. It is not quite as complete as it might have been made, and the bulk of the text consists of extracts from other authors. Nevertheless, it is an excellent compend that covers very well the important matters concerned in medical composition, style, the preparation of typescript and illustrations, the use of scientific terms, foreign words, abbreviations, references, proof-reading, etc. It is a little book with a big purpose. It ought to have a welcome place on the desk of *all* English-speaking physicians who write, or intend to write, medical papers; for the art of writing is not a common possession and even in what Mrs. Mellish calls "its usable substitute, the craft of writing", none of us is perfect.

Progress in Surgery

Selections from Recent Literature

The Painful Traumatic Shoulder. ALEXANDER GIBSON, Winnipeg, Manitoba. *The Journal of Bone and Joint Surgery,* July, 1922.

Gibson calls attention to the influence of minor injuries to the brachial plexus in shoulder-joint injuries. The cases described are explicable only on the basis of such a lesion, he says.

There is, in many shoulder injuries a minor degree of Erb's paralysis, exactly comparable to the birth palsies, due to exactly similar mechanism, and varying as widely in degree. The actual lesion, no doubt, varies from a hemorrhage into the sheath to actual rupture of nerve fibers.

As regards treatment of these conditions, the general principles should be relative rest, active movement being permitted only to a degree which does not cause fatigue or pain. Passive movement is called for only in sufficient degree to prevent contracture. If the joint be moved once per day through its full range of movement this is sufficient. Massage and electricity may be useful adjuncts.

Late Results of Manipulative Treatment of Congenital Dislocation of the Hip. E. LAMING EVANS, London, Eng. *The British Journal of Surgery,* July, 1922.

No orthopedic surgeon can be successful unless he is an optimist; and it is very difficult to dissociate optimism from after-results. Further, it is essential that any classification that is to be intelligible to the ordinarily retentive memory should be short. Hence, for statistical purposes we are compelled to adopt such a classification as good, fair, or bad.

In general terms:—

1. Concentric reductions without any changes in head and neck are good. In fact, Evans thinks they are very good.
2. Concentric reductions with changes in head and neck vary; some are good, others fair. Evans records one bad result in this class—an ankylosis in external rotation and abduction with coxa vara of 90°.
3. Excentric reductions depend upon the degree of absorption. Three cases show good functional results and two fair. It is still too early to say whether progressive arthritic changes will not vitiate these early satisfactory results.
4. Anterior transpositions give good functional results as a rule.
5. Posterior redislocations are indistinguishable from untreated cases.

Evans' method of reduction was founded upon Lorenz's technic: gradually forces were diminished and muscles spared, so that later cases were reduced by a much more gentle and less disruptive process than the earlier ones. Except in very few cases where Evans used internal rotation after Lange's method of retention, he employed a short spica reaching from the waist to above the knee. Early locomotion on a high patten has been adopted. In bilateral cases the period of retention in plaster has been shortened as much as possible—from three to six months. In unilateral cases Evans kept up retention for much longer than is usually accepted—eighteen months to two years. With few exceptions retention has been maintained in 90° flexion, 70° abduction, and an indifferent rotation. Werndorff's axillary abduction has promoted successful retention in difficult cases where the acetabular roof has been markedly deficient.

After removal of the plaster, abduction in walking has been secured by applying a 1½-in. patten to the sound side.

Late Results of Treatment of Congenital Dislocations of the Hip. H. A. T. FAIRBANK. *The British Journal of Surgery,* July, 1922.

The following conclusions are reached by the author:

1. If cases are sent to the surgeon sufficiently early, *i.e.,* before the end of the third year, an anatomical cure ought to be obtained by manipulative reduction in something like 75 per cent. of the unilateral and 50 per cent. of the bilateral cases. In the vast majority of these the function should be excellent, at any rate for many years.
2. Of those giving an imperfect result by the manipulative method, some additional "cures" should be obtained by a second manipulative reduction, followed in two or three weeks' time by open operation, the object of which is the making of an upper lip for the acetabulum without opening the joint. (This is a much less grave operation than open reduction.)
3. Open reduction should not be necessary in the younger cases, but is specially to be considered in those cases of the middle age-group in which manipulative reduction has proved impossible. Only in carefully selected cases should this operation be performed after the age of 6 years.
4. After reduction full right-angle abduction should be maintained for a minimum of six months.
5. Although some of the cases with an "anterior reposition" show remarkably good functional results, we must, in the present state of our knowledge, hesitate to attribute to these patients any permanent advantage over the untreated cases.
6. Physical treatment after removal of the plaster cast, in all but the youngest patients, may exert a permanent influence on the function of the hip, but it probably has no effect on the anatomical result.

The Operative Treatment of Scoliosis. S. KLEINBERG, New York. *New York Medical Journal and Medical Record,* July 19, 1922.

Kleinberg in a preliminary report describes a management of some cases of scoliosis by preoperative treatment of several weeks on a convex stretcher frame, which appears to yield the same degree of improvement as is obtained by the more prolonged treatment in plaster jackets, and is followed by operative fusion and splinting of the spine to retain the improvement and prevent increase of deformity.

Treatment of Fracture Involving Lower End of Radius with Anterior and Posterior Wooden Splints. T. K. RICHARDS, Boston, Mass. *The Boston Medical and Surgical Journal,* July 20, 1922.

To secure the maximum good results functionally in fractures involving the lower end of the radius treated by immobilization with anterior and posterior wooden splints the following points are important:

1. Break up the impaction.
2. Immobilize with splints that fit the bones and not the arm, i. e., narrow splints.
3. Remove the posterior splint on the third day.
4. Cut down the anterior splint on the tenth day.
5. Remove all splints on the twenty-first day.
6. Be sure of active motion of the fingers at all times.
7. Begin intelligent massage and passive motion on the tenth day.

In a word—move the joints adjacent to the fractures at the earliest possible moment.

Pathologic Changes in Muscle as a Result of Disturbances of Circulation. An Experimental Study of Volkmann's Ischemic Paralysis. BARNEY BROOKS, St. Louis, Mo. *Archives of Surgery,* July, 1922.

The author deduces from these experiments that although muscles stand better than skin a continued diminished blood supply, they stand less well a temporary absence of arterial blood. This is an important point which I do not believe has as yet been pointed out. Another fact which is to be emphasized is that after obstruction of an artery for a period of several hours and the subsequent removal of this obstruction the pulse may return in the artery and all of its major branches and yet the circulation may not be re-established in large areas of tissue. The temporary occlusion of the primary arteries of an extremity may, therefore, result in no demonstrable anatomic or physiologic change after the removal of the obstruction if the obstruction has existed only a few hours. If the obstruction exists longer there may be scattered foci of necrosis or degeneration of muscle or extensive massive necrosis of muscles and skin if the period of anemia is prolonged for as much as 17 hours. This necrosis may take place in spite of a resumption of pulsation in all of the larger arteries of the extremity. The pathologic change in the muscles is associated with extensive edema and hemorrhage, but with a very slowly developing inflammatory reaction; and there is not a rapidly developing fibrosis and contracture of the muscles.

Tendon Transplantation for Musculospiral (Radial) Nerve Injury. R. WALLACE BILLINGTON, Nashville, Tenn. *The Journal of Bone and Joint Surgery,* July, 1922.

Billington describes his procedure as follows:

Two assistants are necessary, the whole duty of one of these being to carefully and continuously hold the wrist and fingers extended and the thumb abducted and extended during and after suture of the tendons until the special cock-up splint with thumb-piece is applied.

Three incisions are made: (1) one and one-half inches long over the radial border of the forearm at its middle, opposite the insertion of the pronator radii teres; (2) three-fourths of an inch over tendon of flexor carpi radialis three to four inches above wrist; (3) starting on ulnar border of forearm, four inches above pisiform bone, passes straight down to the level of this bone, and turning at a right angle passes across dorsum of wrist to a point slightly beyond tendon of extensor ossis metacarpi pollicis just proximal to base of first metacarpal. This triangular skin flap is dissected up far enough to expose the finger extensors just proximal to the annular ligament, and the thumb extensors at the "snuff box" area over the carpus, avoiding injury to the radial nerve. These incisions give ample exposure with a minimum of dissection and trauma, as compared with the long U-shaped flap of the Jones-McMurray incision.

The short tendon of the pronator radii teres is now severed from its attachment to the outer surface of radius, having retracted the supinator longus forward. Buttonhole openings are made in the tendons of extensor carpi radialis longior and brevior as low down as possible to permit the severed tendon to be drawn through and sutured to each, after opposing surfaces of tendons are scarified to insure union. Fine silk is used and the exposed, ragged end of the tendon is clipped off flush while the receiving tendon and its raw surface buried with a suture. During and after suture the tendons should be under slight, equal tension with the wrist held in full hyperextension. Here, as elsewhere, the tendons should be handled carefully, avoiding traumatized or raw surfaces of tendons which might cause adhesions. It is important that both long and short extensors be used here so as to give better leverage for extending the wrist with less tendency to radial deviation of the hand than if only one were used.

Next the flexor carpi ulnaris tendon is exposed by sliding the skin slightly and is cut at its insertion, taking care to avoid the ulnar nerve and artery. The tendon is then freed upward as follows: Since muscular fibres are usually attached to within one-half to one inch of its distal end, these fibres are sheared off smoothly from the tendon up to a point two and a half inches above the wrist, leaving a perfectly clean tendon up to this point, and from there separating the muscle by blunt dissection in the line of its fibres obliquely to their attachment to the posterior border of the ulna about an inch higher up. The skin has not been dissected up this far on the dorsum of the forearm, so a tunnel is made subcutaneously from the highest point of the ulnar incision to the extensor tendons at the back of the wrist. The tendon and an inch or so of the muscle above are swung around to the back of the ulna and the tendon drawn down through the tunnel, thus avoiding kinking or twisting and making the direction of muscle and tendon a straight line from origin to new point of insertion. This procedure is simple if understood and insures good function of the transplanted muscle. The extensor minimi digiti and extensor communis digitorum tendons are exposed, by carefully incising and preserving the thin overlying fascia, then buttonholed obliquely from within outward and the transferred tendon drawn and sutured to these four tendons in a similar manner to that previously described. It is not necessary to include the extensor indicis tendon. During and after suture all the tendons should be under slight and equal tension while the wrist and all four fingers are held fully extended. If the tension on the tendons is not equal it will be impossible to actively extend all the fingers fully. The fascia is then closed over the sutured tendons with fine catgut so as to prevent adhesions to the skin.

The tendon of the flexor carpi radialisis now exposed, by retracting the radial end of skin incision No. 3, and divided at its insertion. It is then hooked up through skin incision No. 2 and pulled out, then threaded through a subcutaneous tunnel to the styloid process of the radius. Incise and retract the fascia and expose the three extensor tendons of the thumb opposite the carpus. Buttonhole the extensor ossis metacarpi pollicis and extensor brevis pollicis and draw the transferred tendon through. Sever the extensor longus pollicis tendon, slide the distal segment over alongside the extensor brevis pollicis and suture it end to end to the flexor carpi radialis. The two perforated tendons are fixed to the transferred tendon in the usual manner, after scarifying at proper points to insure union. Here again particular care is necessary to join the tendons under proper tension. It should be just enough to maintain the thumb and its metacarpal in full extension and abduction midway between palmar and dorsal rotation, and with the wrist extended. This position is carefully held until the splint is applied, which maintains it. The overlying fascia is clossed with fine plain gut. All skin incisions are closed and iodined, light alcohol gauze dressings applied and a special long cock-up splint with thumb piece is applied, holding the wrist hyperextended, the fingers not quite fully extended and the thumb in position.

The Value of Ventriculograms in the Localization of Intracranial Lesions. EDWARD BANCROFT TOWNE, San Francisco, Calif. *Archives of Surgery,* July, 1922.

By means of ventriculograms, 3 cases of obstructive hydrocephalus in infants were diagnosed as being caused by occlusion of (1) the foramina of Magendie and Luschka; (2) the aqueduct of Sylvius, and (3) the right foramen of Monro. No other method could have thus shown the exact location of the obstructions.

The Significance of Papilledema in Brain Tumors. I. S. WECHSLER, New York City. *New York State Journal of Medicine,* August, 1922.

Papilledema is the best single sign of brain tumor. It is most often a late sign. It is most common in certain locations such as the pineal or quadrigeminal region, even up to 100 per cent., and least common or altogether absent in others, such as hypophysis. It is frequently absent in many tumors and in many locations which by current theoretical explanation should give choked disk. Internal hydrocephalus is commonly held to account for choked disk, but there are sufficient exceptions to call in question at least part of the theory. Being usually a late sign it is not the best guide to treatment although it is always an urgent one. As we are gradually learning to diagnosticate tumors by more refined methods operation is justified whenever we can satisfy ourselves that the proof of the existence of a neoplasm is clinically fairly conclusive, even in the absence of choked disk. This holds good at present for tumors of the motor

cortex or acoustic neuromas, but should hold good also in other regions, as soon as localization is made with a fair degree of accuracy. Every case of brain tumor becomes surgical, though not necessarily operative, as soon as a diagnosis is made, whether localized or not and whether there is choked disk or not. Greater knowledge of the fundus changes in brain tumors is needed, and effort should be made to restrict as far as possible the use of the terms papillitis, papilledema and optic neuritis to sharply defined ophthalmoscopic pictures.

Results of Treatment in Forty-eight Cases of Sciatica. WILLIAM O. OTT, Rochester, Minn. *Annals of Surgery*, August, 1922.

In 48 cases of sciatica in which no definite causative factor could be found, repeated epidural injections (1/200 procain in saline solution) combined with the removal of possible foci of infection in a large percentage, resulted in permanent cure in 29%, and permanent amelioration of symptoms so that the patient was able to continue his occupation with a fair degree of comfort in 37%; in the remaining 34% no permanent beneficial results were obtained. From one to four injections were used.

Repair of Peripheral Nerves. BENJAMIN F. DAVIS, Duluth, Minn. *Minnesota Medicine*, August, 1922.

At present there are but three surgical methods which are at all worthy of consideration, namely: end-to-end suture; the so-called cable-graft, and the fascial tube.

Of these, the first is by all means of greatest importance; the other two should be used only when end-to-end suture cannot be obtained. In performing the operation of end-to-end suture, it is essential to permit the ends of the nerve to come into actual contact without undue tension. In many instances, this may be done without trouble. Many times, however, the gap to be bridged will make it impossible to approximate the nerve ends without resorting to other measures. There are in general four aids which we may employ.

First, mobilization; second, transposition; third and fourth, flexion of joints and adduction of limbs.

A fifth method may also be of great assistance. In case none of the four above mentioned suffices, it is wise at times to suture the fibrous ends of the divided nerve as near together as may be, with the limb strongly flexed, and then by gradually extending the limb, in the course of several weeks, so stretch the nerve that upon secondary operation it may be possible to resect the scar tissue and obtain direct end-to-end suture. Resection of segments of bone in order to permit approximation of severed nerve trunks must be very rarely indicated.

Naffziger considers the following figures to represent the average of distances which may be bridged:

For the ulnar nerve: mobilization alone—3 cm., mobilization and transposition—4.5 cm. Adduction of the arm permits a slight additional gain and mobilization, transposition, adduction and complete flexion of elbow and wrist, 10 cm.

Musculospiral mobilization—2 cm., with elbow flexion, 8 cm., adduction adds .5 cm., mobilization, elbow flexion, transposition and adduction—10 cm.

Median: mobilization—2 cm., mobilization, adduction and elbow flexion, 9 cm.

Sciatic, internal and external popliteal trunks: mobilization—3 cm: mobilization, extension at the hip and flexion at the knee, 9.5 to 10 cm.

These figures represent distances which may be bridged at one-stage operations. With two-stage performances, additional gains may be made. It is important to preserve the nerve pattern during these maneuvers so that sensory nerves may not grow down motor pathways.

When sufficient length of nerve trunk has been secured, the ends of the nerve segments should be cut off above any infiltrating scar tissue and gently approximated. As suture material, either fine waxed silk or fine plain catgut may be used. In large nerves it may be permissible to pass one or two sutures directly through the nerve trunk. Otherwise, the sutures are passed through the epineurium. It is important that the nerve ends be not jammed together too tightly by the suture.

The cable-graft method consists in sewing into the gap between the nerve ends segments of some sensory nerve. As the sensory nerves chosen are usually less in diameter than the nerve which is to be repaired, one may actually make a cable of the sensory nerve by implanting 3 or 4 more segments side by side in the space to be bridged, these segments of nerve being regarded exactly as segments of a conduit system.

The fascial tube will rarely be necessary in view of the two methods just discussed. At best, it is a measure fraught with great uncertainty.

If signs of returning function do not appear in from three to six months, it is wise to make a second operation and examine the condition of the nerve at the point of suture. If, upon exposing such a nerve, we discover that its continuity is interrupted by contracting scar tissue or some other pathological condition at the line of suture, we can resect the affected portion and perform a new suture with good prospects of success. In determining whether or not the neuraxes have crossed the suture line, use is made of the fact, emphasized by Malone, that stimulation of intact sensory or mixed nerves causes reflex stipulation of respiration. If upon exposing the nerve trunk which has been sutured some months previously and applying a threshold stimulus, 2 cm. or more distal to the suture line, we get no effect upon respiration, it is conclusive evidence that regeneration beyond the line of suture has not occurred and resection of the scar with resuture is then indicated. If, however, reflex respiratory stimulation appears we know that nerve fibers have crossed the suture line and are on their way down the new nerve trunk. This test is of no service in a motor nerve, but is applicable to any sensory or mixed nerve.

Failure in nerve suture may be due to cicatrization, to improper technique, to hemorrhage and cyst formation.

Labyrinthine Surgery. J. MORRISSET SMITH, New York. *New York Medical Journal and Medical Record*, July 19, 1922.

Smith Concludes:

Considering the number of ear infections, the labyrinth operation is rarely indicated.

Where there is any labyrinthine function still present, a labyrinth operation is contraindicated.

Where there is a dead labyrinth, no symptoms, and a normal spinal fluid, only the most conservative operation should be attempted.

A spinal fluid analysis with a culture furnishes the most accurate information as to the progress of the infection.

The prognosis in types one and two is good and in type three doubtful.

The problem presented in type three is at present a difficult one and we must bear in mind the possibility of a radical operative procedure, inducing as well as preventing a diffuse meningitis.

Pharyngeal Diverticulum and Its Surgical Treatment, with a Report of Two Cases. D. P. D. WILKIE AND J. N. J. HARTLEY, Edinburgh. *The British Journal of Surgery*, July, 1922.

After relating 2 interesting cases the authors conclude:

1. A pharyngeal diverticulum is an abnormal protrusion of the mucous membrane of the lower part of the posterior wall of the pharynx, between the oblique and transverse fibres of the cricopharyngeus muscle.

2. It occurs most frequently in men past middle life.

3. The condition is more common than has hitherto been supposed, for, although only some 200 cases have been recorded, the majority of these have been within comparatively recent years.

4. Two etiological factors are involved: the one—a weakness of the wall—is problematical; the other is increased intrapharyngeal pressure.

5. In exceptional cases, an organic stenosis has been present: in the majority, the primary cause would appear to be the incoordinate action between the propulsive and sphincteric elements of the pharyngeal muscle.

6. Radioscopy has replaced all other special diagnostic methods.

7. Treatment must be directed to both cause and effect, by dilatation of the stenosis, be it organic or functional, and extirpation of the sac.

8. The one-stage operation is ideal, but not devoid of danger, the chief risk being leakage and cellulitis of the planes of the neck.

9. The two-stage operation is that recommended in feeble and elderly patients.

10. The modification of the two-stage operation, in which a submucous excision of the sac is made at the second stage, though perhaps not the most radical, is, however, the one involving least risk to the patient's life.

Syndrome of Malignant Tumors of the Nasopharynx: A Report of Seventy-Nine Cases. GORDON B. NEW, Rochester, Minn. *Journal of the A. M. A.*, July 1, 1922.

New says: (1) malignant tumors of the nasopharynx are much more common than has been believed; (2) the syndrome which they present is not generally known, which accounts for many patients being treated medically and surgically without the discovery of the tumor, and (3) there is a striking lack of nasal or nasopharyngeal symptoms in many of these cases. Seventy-nine cases demonstrate that many nasopharyngeal tumors are overlooked. This may be due to the fact that the patients consulted internists, neurologists, general surgeons or ophthalmologists, and an examination of the nose and throat was not made. In most cases, however, the tumor had been overlooked because a careful nasopharyngeal examination had not been made by the laryngologist. The syndrome presented by these tumors is quite typical, and the finding of a small nasopharyngeal tumor will usually clear up the diagnosis in cases in which it had been previously impossible to account for certain symptoms and findings associated with the head.

Goiter; From the Standpoint of the Clinician. C. E. ERVIN, Danville, Pa. *The Pennsylvania Medical Journal*, August, 1922.

The colloid goiter of adolescence is common in young girls, is unaccompanied by symptoms, usually disappears of its own accord, but may leave behind a troublesome adenoma that has developed coincidentally with the rest of the goiter.

The colloid of adolescence is apparently preventable by the administration of iodin during childhood, twelfth to seventeenth year. The adenomas may be preventable by the same means.

Exophthalmic goiter is treated most successfully by a combination of rest and surgery. Radium or *x*-ray may be useful in some cases.

A large percentage of adenomata become toxic, causing especially cardiorenal degeneration. The treatment is surgical.

The Use and Abuse of Thyroid. J. H. MEANS, Boston. Mass. *The Boston Medical and Surgical Journal*, August 3, 1922.

In thyroid we have a highly active drug. The conspicuous feature of its action is the increasing of the rate of combustion within the body and the production of the symptoms associated therewith.

Certain clinical conditions exist in which a low metabolic rate is undoubtedly due to underactivity of the thyroid. In such the administration of thyroid relieves all symptoms. Certain types of non-toxic goiter may be included in this group.

In conditions other than hypothyroidism no conclusive indications for the use of thyroid have yet been found.

In normal persons the ingestion of thyroid produces unpleasant if not harmful symptoms. In obese persons it does the same. In simple obesity there probably is no element of hypothyroidism. The use of thyroid in the routine care of obesity would therefore be unwarranted. An exception may be made when thyroid therapy is coupled with partial starvation.

Whenever thyroid is used in conditions other than hypothyroidism—in obesity, for example, or empirically in other conditions—it should be used with the greatest caution. The physician should have a full understanding of its action and of the harm it may do, and have his patient under careful observation, so that the drug may be stopped at once if ill effects arise.

Self-dosing with thyroid by the laity is highly undesirable. The profession should do its utmost to discourage this practice.

Residual Lactation Acini in the Female Breast. Their Relation to Chronic Cystic Mastitis and Malignant Disease. JOSEPH MCFARLAND, Philadelphia, Pa. *Archives of Surgery*, July, 1922.

Involution, the atrophy of the no longer needed mammary lobules is a complicated process whose details vary in different individuals, in the different breasts of the same individual, and in different parts of the same breast, according to local and general conditions.

One of the most important sources of the modification of involution is retention of secretion. Its effect is in proportion to its extent and distribution, and is without regularity. Its most striking result is the appearance of residual lactation acini. Residual lactation acini are harmless decadent structures having no significance in respect to the subsequent appearance of malignant disease. The accumulated cellular and amorphous débris resulting from involution sometimes obstructs the outlets of the ducts and acini, leading to retention of secretion and exudation of fluid with cyst formation. The cysts may result from dilatation of either the ducts or the residual lactation acini. The cysts may be of a size varying from that of a pin-head to a hen's egg and may be single or multiple, uniformly disseminated, or collected in groups. They usually have smooth walls and clear serous contents. The pressure exerted on the surrounding tissue by the growing cyst gives rise to sensory disturbances that vary in intensity according to the firmness or softness of the stroma. In a breast with stroma largely mucinoid or adipose, they may occasion no symptoms.

The cysts are benign and harmless. If they become large their excision may be indicated to make the patient more comfortable. Cancer cysts are not specific entities. They are the result of the accidental coexistence of cysts and cancer in the same breast. Original contiguity followed by increase in the size of each determines final continuity. The so-called chronic cystic mastitis is not inflammatory, and is not a pathologic entity; it is nothing but a result—or at most—a perversion of involution.

It would, therefore, be desirable to abandon the term, and call the condition "cystic disturbance of the breast," or if it seems better to retain one of the older designations, that of Warren—"abnormal involution"—is probably least objectionable. The only difficulty lies in clearly defining when the process of involution can be said to become abnormal, when it is so diversified. The term "adenoma" should be used only when speaking of the encapsulated tumors of the breast. Parenchymatous increases of unencapsulated or diffused form are hypertrophies and not related to tumors. There is no "cyst adenoma" of Schimmelbusch. The term is objectionable because it makes it appear as though a tumor existed where no tumor is. The appearance on which the name depends is that result of involution to which the name residual lactation acini has here been given, and which can easily be found in one-fourth of all breasts that have lactated.

Post-Operative Massive Collapse of the Lungs. F. J. HIRSCHBOECK, Duluth, Minn. *The American Journal of the Medical Sciences*, August, 1922.

The physical signs and symptoms of massive collapse are distinctive. A careful study of the case will make differentiation from conditions simulating it very easy. The exciting factor varies a great deal, and any trauma, accidental or otherwise, necessitating more or less immobilization of the body may bring about the condition. It has been known to follow all methods of anesthesia, has occurred with local anesthesia and without any anesthesia at all. In civil life it will be found that abdominal operation is the most frequent cause of the condition, on account of its immediate effect in producing immobility of the diaphragm and deficient aëration of the lungs. The condition may develop within a few hours or as late as one week after the trauma. The onset is sudden, the course either rapid or at times protracted and resolution either prompt or slow. The temperature is usually very moderate, but may be as high as 103° or 104°F, the coincidence of inflammatory phenomena probably influencing it. The respiration rate is increased by the immobility of the affected part, by an accompanying pleuritis or by inflammatory complications. The pulse-rate is found to be more or less in direct relationship with the

respiratory and thermic changes, but is less marked in uncomplicated cases.

One is impressed by the diminished or absent excursion of the chest wall over the affected area. The cardiac impulse is displaced toward the affected side and is as marked in the left-sided cases as in those on the right, the apex having a tendency to tilt outward and upward, so that the apex-beat may be felt in the axilla. In right-sided affections the impulse may be felt at the tip of the sternum or to the right of it. These signs are corroborated by roentgenograph, the heart retraction being most marked, the dome of the diaphragm ascending to an unusual degree and the pulmonary area appearing partially or totally collapsed. In bilateral affections the displacement of the heart is absent, but the high position of the diaphragm and the collapse of the lungs are manifest. The intercostal spaces on the affected side are narrowed, leading to a relative approximation of the ribs. The percussion note over the affected area is dull and may approach flatness. Rose Bradford points out that in left-sided cases the lower part of the chest wall is highly resonant, due to the abnormally high level of the diaphragm, the liver interfering with this sign in right-sided cases. Breath sounds and fremitus are usually increased, sometimes enormously so, but may be diminished or absent. The transmission of voice sounds may be so intense as to approach whispered pectoriloquy.

Bronchophony was present in all of Hirschboeck's cases, and in no case was there diminution of the breath sound or fremitus. Rales are usually absent in the early stages, but supervene as the case progresses, probably due to a bronchitis, resolution or an occasional pneumonia developing. In a great many cases a pleural friction rub is plainly audible. In the later stages of the condition, when expectoration is rather profuse and resolution occurs, rales are more frequent. As resolution occurs the heart gradually returns to its original position, the lungs slowly expand and the diaphragmatic dome flattens out.

The extent of the symptoms and the ease of recognition depend upon the amount of lung tissue involved and as to whether the condition is unilateral or bilateral. The influence of the condition on the patient's economy is dependent largely upon complicating factors as well as upon the extent of the lesion. Dyspnea may be moderate or extreme, as it usually is in bilateral cases. The cough is slight, as a rule, in the beginning, with a rather scant expectoration, but in the later stages it is accompanied by profuse mucopurulent sputum. The sputum is rarely or never bloody—an important consideration in the differentiation between pneumonia or infarct and collapse.

Bronchitis, pleurisy and pneumonia are recognized as complications. Effusion has been known to follow pleurisy. A differentiation must be made between pneumonia, hypostatic congestion of the lungs, embolus, infarct, pleuritis (with or without effusion), hemothorax and massive collapse. When one bears in mind the outstanding pathognomonic signs of massive collapse, confusion with other conditions is difficult.

The prognosis is invariably good, but bilateral cases, or cases affecting more than one lobe, are more apt to be fatal, particularly in debilitated subjects.

The Value of Artificial Aids to Respiration in Acute Operative Collapse of the Lungs (Surgical Pneumothorax) Occurring in the Course of Intrathoracic Operations. RUDOLPH MATAS, New Orleans, La. *Archives of Surgery*, July, 1922.

It is undeniable that in a certain, but undetermined, percentage of cases, the opening of one pleura may be attended by alarming or even fatal manifestations. To protect the patient against these unknown but possible dangers, the simplified methods of plus pressure ventilation of the lungs on the Meltzer-Auer principle are the safest and best for general use. Whether by the usual anesthetic face mask, by intratracheal intubation, or, preferably, by nasopharyngeal catheterization (the simplest and safest method), the requirements of anesthesia and pulmonary ventilation are combined in the gas-ether-oxygen sequence appliances, now in current use in almost every surgical clinic of this country. These deliver a steady stream of the combined or simple gases under a regulated plus-pressure sufficient to maintain the respiratory function of the lung during anesthesia. The objections on the score of expense, complexity, and cumbersomeness that have been urged against respiratory aids in thoracic surgery are no longer tenable, nor does the special objection to "the inflated lung" as an obstacle to the intrathoracic technic hold good in view of the perfect control, at the present time, of the movements of the lung and of the maintenance of the respiration in spite of the collapsed state.

Relation of Anesthetic to Pulmonary Abscess Following Nose and Throat Surgery. C. N. CHIPMAN, Washington, D. C. *The Journal of the A. M. A.*, August 12, 1922.

Is lung abscess due to aspiration or embolism? It is difficult to see how the cause can frequently be other than aspiration, when we consider that, out of thirty-three cases, the right lung was involved near the hilum twenty-seven times. Embolic abscess is most frequently found near the edges, rather than the center of the lung. When all facts are taken into consideration, we must conclude that lung abscess is caused both by aspiration and by the infective embolus, carried to the lung by the blood stream or lymphatic system.

HOW TO PREVENT LUNG ABSCESS

1. A patient should not be operated upon within seven days after an attack of tonsillitis, or when there is acute bronchitis or a fever from any cause.
2. The patient should be in the hospital at least six hours, or better, twenty-four hours before operation.
3. The mouth and teeth should be thoroughly cleansed, before the operation, with some antiseptic solution.
4. Only light anesthesia should be used.
5. The head should always be down, and by suction the pharynx kept free from infective material.
6. The tonsils and pharynx should be painted before operation with ½ strength tincture of iodin; also the cavity should be swabbed with iodin after removal of tonsils.
7. Bleeding should be stopped at once by suture or ligature rather than prolonged sponging, thus reducing the anesthesia and obtaining a dry pharynx.
8. In all nose and sinus operations, a posterior nasal plug should be used.
9. The patient should be returned to his room on his side, with the head down.
10. After operation, the foot of the bed should be elevated until the patient has fully reacted, unless the patient has high blood pressure.
11. Last, but not least, nose and throat operations should receive the same care and skill by both the surgeon and the anesthetist as are given to an abdominal operation; and there will be fewer lung abscesses to report.

Consideration of the Surgical Treatment of Bronchiectasis. EVARTS A. GRAHAM, St. Louis, Mo. *Southern Medical Journal*, August, 1922.

The treatment of bronchiectasis has always been unsatisfactory. Certain cases of recent origin respond to the comparatively simple procedure of artificial pneumothorax and are made free from symptoms. In some cases a foreign body is present which should be removed. Radical surgery should probably not be attempted until after less radical measures have been tried. There are certain cases in which satisfactory results can be obtained only by radical means. Pneumotomy with simple incision and drainage of the cavities has generally proven unsatisfactory. The most radical measure is lobectomy when the process is confined to a single lobe. A fourth case in which lobectomy was performed with an entirely satisfactory result is described.

Abdominal Trauma. W. U. KENNEDY, Newcastle, Ind. *The Journal of the Indiana State Medical Association*, July 15, 1922.

Abdominal trauma may set up a type of peritonitis resulting in a pure form of generalized adhesion and without demonstrable laceration of intestine. As a result of such peritonitis an agglutination of bowel may occur resulting in varied form of obstruction. Such a peritonitis may occur without intervening sepsis. It may be clearly differentiated from the septic, the hemorrhagic, or the chronic hyperplastic type. It may be accounted for by damage to the autonomic center.

A trauma followed by persistent rigidity of the wall and continued nausea is indicative of this type of peritonitis. Such a group of symptoms plus acute obstruction or the increasing toxemia of stasis necessitates exploration.

Unless obstructive and toxic elements are definitely present and ominous a waiting policy is advisable. In medico-legal cases, an abdominal trauma, with persistent symptoms may be regarded as a causative factor.

Excision of Ulcer of the Duodenum. E. STARR JUDD, Rochester, Minn. *The Journal-Lancet,* August 1, 1922.

In the operation described the ulcer is excised without attempting to enlarge the pylorus.

The incision into the duodenum is made transversely on a line parallel with the ring fibers of the pylorus. The upper transverse incision is usually placed just below the pyloric muscle, and the lower one far enough below the ulcerated area to pass through good tissue. After the ulcerated area has been removed the entire surface of the mucous membrane of the duodenum and pyloric end of the stomach are exposed for inspection. Multiple ulcers are found in a large number of cases. Contact ulcers are much more common than believed, and ulcers on the posterior wall some distance from the pylorus have been unexpectedly encountered in several instances. In some of the cases of multiple ulcers it has seemed best to cauterize and suture over the deep ulcers, and finish with gastroenterostomy. In most cases, however, we are able to destroy all of the ulcers and finish with a good duodenum. After suturing over the deep ulcers the opening on the anterior surface is closed by three layers of sutures, thus the pyloric end of the stomach is sutured to the anterior surface of the duodenum, which almost amounts to a gastroduodenostomy. The entire duodenal cap is destroyed, so that a röntgenogram made after the operation reveals much the same deformity as that produced by the ulcer. This point must be kept in mind in making postoperative *x*-ray examinations.

The operation has been performed in 141 cases in the Mayo Clinic with satisfactory results. The immediate results are very gratifying, and the convalescence is easier than after almost any other operation on the stomach. There is no vomiting, and apparently the stomach empties itself at once. In one or two cases there was some evidence of oozing, as shown by the tarry stools. This, however, was of no consequence. There was one death in the series; an elderly woman developed pneumonia and died on the tenth day. In most of the cases the functional result was very good.

The Best Technic for Gastro-enterostomy as Determined by Functional Results. ABRAHAM O. WILENSKY, New York, N. Y. *The American Journal of the Medical Sciences,* August, 1922.

Evidence is presented which seems to Wilensky to show that the functional result of a gastro-enterostomy made with the aid of a Murphy button is superior to that of a gastro-enterostomy made by the suture method.

Surgical Injuries to the Bile Passages. A. E. ACHER, Fort Dodge, Iowa. *The Journal of the Iowa State Medical Society,* July, 1922.

The most important factors in the etiology of injuries of the bile ducts are:

1. The lack of knowledge on the part of the majority of surgeons that variations in the mode of union, course and length of the cystic, hepatic and common ducts are far more common than our textbooks on anatomy have led us to believe.

2. The presence of anomalies in the mode of origins and course of the cystic and hepatic arteries resulting in hemorrhage, and the inclusion of the bile ducts, either in the grasp of the artery forceps, or in a ligature applied around the bleeding point.

3. The obliteration of landmarks as the result of inflammatory changes.

4. The inadequate exposure of the field of operation.

5. The closed method of operation.

Acher considers these factors and describes some of the variations of the arteries and the ducts.

The closed method of operation which consists of clamping and dividing the structures concerned after locating them through their peritoneal covering. The open method is advocated by some as a means of overcoming this obstacle. By this method the gastrohepatic ligament is made taut by pulling to the left the stomach and intestines and at the same time pulling to the right on the gall-bladder and liver. The right free border of the gastrohepatic ligament is then opened and the ducts and bloodvessels are exposed to view. The cystic duct is always separated from its bed before ligation. The insertion of cystic duct into the common duct and all other relations are noted. The variations from normal can be detected by this open method of operation. The author emphasizes the importance of definitely locating each structure before a clamp is applied and any cutting done.

The Surgical Value of the Estimation of the Bile Pigmentation (Icterus Index) of the Blood Serum. DEWITT STETTEN, New York. *Annals of Surgery,* August, 1922.

Stetten describes an apparently satisfactory and simple colorimetric method (worked out, at his suggestion, by Bernhard and Maue at the Lenox Hill Hospital) for determining the presence of bilirubin in the blood serum and, if present, its relative concentration. The test is valuable not only in determining whether a doubtful coloration of the skin or sclerae is a true icterus, but also in determining whether an icterus is increasing or decreasing, and it is therefore important in differential diagnosis and in deciding upon the wisdom of delaying operation in certain cases, e.g., of common duct lithiasis. Stetten states that previously devised tests have been unsatisfactory in one or another respect. The van der Bergh test, recently described in these columns, he refers to as involved and protracted; he does not mention, however, that it is said to be a means of distinguishing between obstructive and non-obstructive jaundice.

Some Experiences with the "Meltzer-Lyon" Test in Gall-Bladder Disease. ELLIOTT C. CUTLER AND FRANCIS C. NEWTON, Boston, Mass. *Surgery, Gynecology and Obstetrics,* August, 1922.

In the opinion of Cutler and Newton, the Meltzer-Lyon test is still in the experimental stage and should be used only by those who are qualified and equipped to study and criticize its value. It requires *x*-ray apparatus, much time, repeated examinations on all cases, and elaborate bacteriological and cytological studies. The test depends upon the law of contrary innervation which has not been proven. In the cases described, experiments show that syphonage is the principal factor in the discharge of bile into the duodenum. What determines the intensity of the color of the bile is unknown. The test cannot be depended upon for diagnostic purposes.

Pelvic Hematocele from Causes other than Ectopic Pregnancy. J. WESLEY BOVÉE. Washington, D. C. *The American Journal of Obstetrics and Gynecology.* June, 1922.

Bovée analyses the literature of this subject and reports two cases of his own.

Causes.—It is presumable that in most cases a local abnormality is at least a contributory factor.

These may be classed as : (1) menstrual, excessive congestion; (2) nonmenstrual, (*a*) active hyperemia from infections or their results; (*b*) passive hyperemia, thrombosis, prolapse, varicosities, torsions, adhesions; (*c*) new growths.

But there are often remote or general causes activating or promoting. Among them are, (1) acute or chronic poisoning; (2) various diseases already mentioned which embarrass the circulation, causing passive hyperemia; (3) various general infectious diseases; (4) hemophilia; (5) burns and ulcers; (6) diseases producing marked blood changes.

The amount of blood loss may be trivial, or so great as to produce rapid death, or be between these extremes. The danger of grave hemorrhage is practically limited to the pelvic hematocele, the ovarian hematomata being usually circumscribed and therefore permitting less blood loss. While the atretic follicular, follicular and stromal types are usually small, they may coalesce, thus forming one large

hematoma that may in turn rupture, thus permitting uncontrolled hemorrhage into the pelvic cavity. The corpus luteal variety seems prone to provide a grave type of hemorrhage with its associated phenomena. Both ovaries may coincidently be affected or one after the other.

Symptoms.—The symptoms of free hemorrhage from the ovary are so little understood that a mistaken diagnosis is usually made. They vary with the amount of blood loss probably more consistently than when the lost blood is contained in the ovary. Probably the greater proportion of cases having ovarian hemorrhage, or even tubal, into the peritoneum have symptoms so slight that they are ignored, or attributed to menstruation which they commonly accompany. Those of the grave forms may be of an overwhelming character such as are noted in profuse and rapid intraperitoneal hemorrhage from any cause. Usually the attack is ushered in by sudden and severe localized pain with collapse and metrostasis. In many instances the attack promptly follows some physical exertion such as moving heavy furniture. Accidents have been noted as exciting causes. Menstruation is frequently found to be present or appearing shortly afterward. In those from the corpus luteum Novak has found menstruation has usually ceased several days in advance. If local disease be a predisposing cause manifestations of its existence, such as localized pain, painful or habitually delayed menstruation will be present. If the process be a slow but practically continuous one the uterine bleeding is apt to continue, and a feature is the peculiar yellowish color of the blanched skin and conjunctivae. Acute infections have their characteristic phenomena. Physical examination, especially at the onset would reveal hypogastric and pelvic hypersensitiveness and perhaps abdominal distention and the usual evidence of concealed hemorrhage. After the blood has attempted organization the mass may be recognized by vaginoabdominal or rectoabdominal examination. After a few weeks in a moderate case a tender pelvic mass may be outlined in one or both sides of the pelvis. Of course rectal and vesical symptoms may be expected from the presence of such masses.

Diagnosis.—The diagnosis of pelvic hematocele in mild cases is a matter of extreme difficulty. In fact it is practically never made before operation. As already mentioned it is probable that often the condition is regarded as a stormy menstrual period or straining of the uterine supports, indigestion, very mild appendicitis, or ovarian congestion. If a history of previous pelvic infection, overexertion, pelvic injuries incident to parturition or becoming chilled at or just preceding a menstrual period exists, then such conditions by means of their sequelae are regarded as the sum total of the actual conditions present.

When the condition is pronounced, as in the case of a rupture of a tube or a large rupture of an ovary accompanied with a rapid and profuse hemorrhage, or profuse hemorrhage from or into a tumor in the pelvis, then the two cardinal symptoms of hemorrhage and pain point to either a hematoma or usually, a hematocele in the pelvis. During the child-bearing age the question of ectopic pregnancy must be settled. Usually the nonpregnant condition occurs at a menstrual period except in the corpus luteal hemorrhage when the attack is apt to occur ten to fifteen days subsequent to menstruation and has less indication of ectopic pregnancy. But when the tissue injury and pain are moderate in degree the condition has to be differentiated from acute appendicitis, ruptured ectopic pregnancy, torsion of the pedicle of a pelvic tumor—such as a pedunculated uterine fibroid or an ovarian tumor, and threatened or incomplete abortion in a uterine pregnancy. In the moderate and severe forms, the hemorrhage may be detected by study of the blood and perhaps by the usual symptoms of profuse, concealed hemorrhage. The leucocyte and the red cell count, as well as the hemoglobin percentage should be higher in acute appendicitis than in pelvic hematocele. Physical exertion at or just preceding the onset is a feature in pelvic hematocele and not in acute appendicitis.

Burns, ulcers and trauma are likewise productive of hematocele rather than appendicitis. After several days or weeks have followed the onset without surgical intervention, prolonged metrostasis and localized pain may easily lead to suspicion of early tubal or ovarian pregnancy or incomplete abortion as well as pelvic hematocele. The presence or expulsion of a uterine decidua would not occur in non-gravid pelvic hematocele. But the history of regular menstruation, long continued metrostasis and the presence of a tender mass lateral to the uterus in either or both sides, without enlargement or material softening of the uterus together with the history of onset and progress point to pelvic hematocele A boggy mass felt in the cul-de-sac of Douglas would be confirmatory.

An Improved Medium for Urography. S. R. WOODRUFF, New York City. *International Journal of Surgery*, July, 1922.

In the Urologic Clinic at the New York Post-Graduate Hospital a sufficient quantity methylene blue is added to the pyelograph solutions to give a deep-blue color for the purpose of tracing it when injecting, as a part of the technic.

This has been found of inestimable value in pyelography because of the fact that when the renal pelvis has filled, the blue color of the medium can be recognized at the ureteral orifice as it is discharged alongside the catheter. This knowledge cannot, of course, be obtained with a colorless pyelographic medium. The color is also of value after taking the pyelogram in allowing one to check up the quantity of medium known to have been injected, by collecting it in a test tube.

Within the past few months, a solution of bismuth and ammonium citrate as a urographic medium has been used with most satisfactory results. It has proven itself the least irritating of all media yet tried. It fulfills all the requirements enumerated above and gives the best urograms yet to be demonstrated.

The preparation of the solution is as follows: one ounce of the salt is dissolved in four ounces of hot water and a few drops of ammonia water added, if necessary, to complete solubility. This makes about a 23 per cent. solution, which is the maximum strength necessary for delineating the renal pelvis or ureter. Ten per cent. (or even five in thin individuals) is sufficient for the bladder. After solution is complete, it is filtered, the methylene blue added and the whole run through cotton. Sterilization in a water bath is the next step, and then the solution is placed in ounce bottles until ready for use. The usual pyelogram will rarely use over an ounce of medium which will allow an individual bottle for each case. If more is required extra bottles are always at hand. This prevents contamination of the entire amount that has been prepared if opened at each time urography is performed. Repeated sterilization of stock solutions will result in chemical change or increasing the strength of the solution to alarming proportions.

Concerning the Interstitial Cells of the Testicle. (*Ueber die Zwischenzellen des Hodens.*) PROF. DR. CARL STERNBERG. *Wiener klinische Wochenschrift*, July 20, 1922.

The interstitial cells are found very early in the embryo and are of connective tissue origin. At certain stages they are present in large numbers and later the number decreases; increase occurs at the time of puberty. In pathological conditions one frequently, but not always, finds an increase of these elements with an atrophy of the testicle. All of these facts seem to indicate that these cells are a help to the generative parenchyma of the testicle. Instances occur which show that the cells have a secretory and resorptive function and activity; and often this seems to be a compensatory function in the presence of non-activating testicle parenchyma.

Possible Defensive Factors in Cancer of the Rectum. WM. C. MACCARTY and J. K. W. KEHRER, Rochester. *Journal of Laboratory and Clinical Medicine*, July, 1922.

The average length of post-operative life, when the factors of lymphocytic infiltration, fibrosis, hyalinization and differentiation are present, is greater than when the factors are absent. When some of these are present, the average length of post-operative life is 146% greater than when none of them is present. When all four factors are present the average length of life is 196% greater than if none of them are present.